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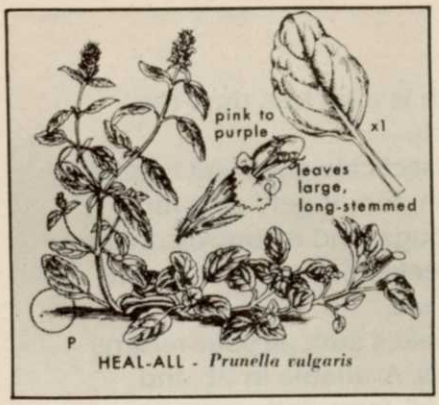
WT&T

Cover:
Landscape at Sea World, San Diego.

MARCH 1982/VOL. 21, NO. 3

Jim McKay, GCSAA Show coverage.



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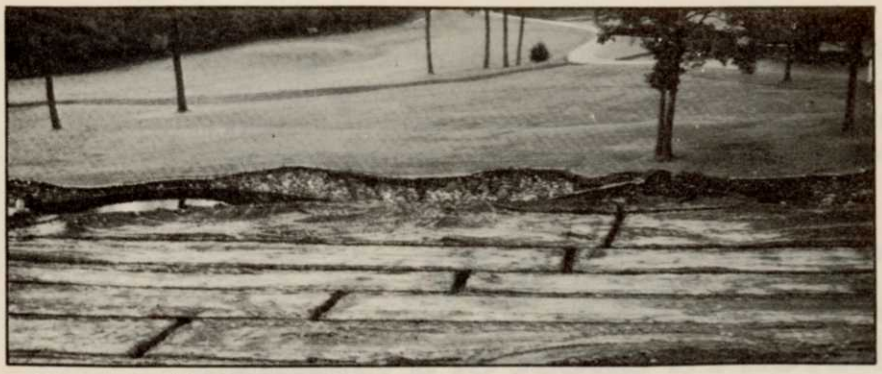

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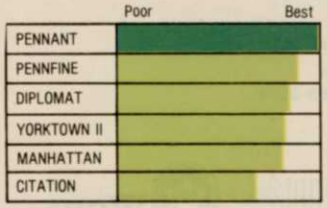
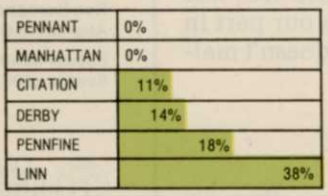
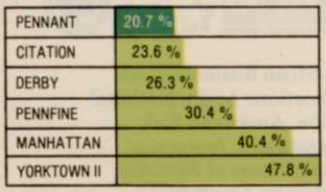
Warm and cool season average turf score, Southern California first-year tests, 1979.



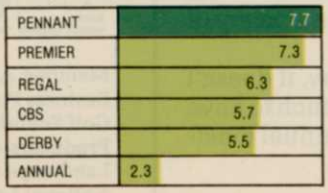
Percent winter injury. Adelphia, N.J. March 1978. (10 of 26 varieties tested showed no significant injury.)



Pennant was best among 12 varieties tested for red thread disease (Corticium fuciforme) in 1-year average, 1979-80. Western WA. (Low score = Best).

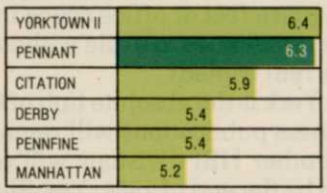


Average Turf Performance scores, February 1980. Southern Arizona turf overseeding on Tifgreen Bermuda. Sixteen entries seeded October 1979. (10 = Best).

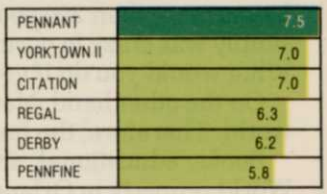


* Plant variety protection pending and anticipated

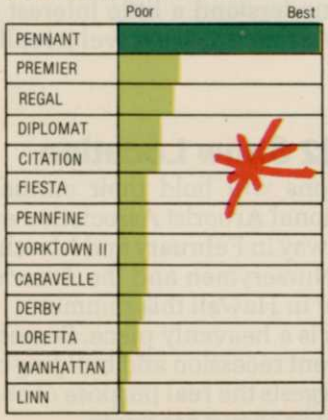
Turf performance scores. North Brunswick, N.J. 1975-78. (9 = Best).



Reaction to brown patch disease (Rhizoctonia), Adelphia, N.J., 1978. (9 = least damage)



Pennant was best among 57 varieties tested for sod webworm tolerance (lawn moth - Crambus spp. of the order Lepidoptera), Adelphia, N.J., August, September, October 1980.



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OUTLOOK

By Bruce F. Shank, Executive Editor

Bob Earley Named Group Publisher

Bob Earley, editor and publisher of *Lawn Care Industry* magazine, has just been named Group Publisher of *Weeds Trees & Turf* and *Pest Control* magazines. He now shares his bearded presence with WTT readers as he did in 1976 when he was managing editor.

If you haven't heard one of his speeches in the last three years at regional turf shows you are rare. He has given thousands of speeches across the U.S. in an effort to help the lawn care industry organize and grow. Obviously, his efforts combined with others were successful.

This same energy and drive will now be partly channelled into WTT. The results should be obvious within the next few months. His favorite method is to put people in the magazine. No doubt we will have many more profiles in coming months of successful men and women in all Green Industries. He also likes to visit every possible landscape event to keep in touch with the market on a first hand basis.

Bob and I started with these magazines eight years ago. Despite all the talk of staff changes, he and I have been here. Now we have the reigns and will direct the magazine's energy as the years have taught us. Please let us hear from you if you have ideas which you think need work to serve the Green Industries.

No Shamu For Weeds

You may have seen the newspaper accounts in February about Harcourt Brace Jovanovich moving its headquarters to Orlando, Florida. That is completely true, but *Weeds Trees & Turf* and *Lawn Care Industry* will remain in New York.

The costs of office space in New York are simply insane. HBJ leases more than 300,000 square feet of office space in New York. It simply was crazy to permit rental rates to triple without some action. What would you do if your rent tripled?

On the other hand, New York is the absolute hub of the publishing world. Therefore, the business publications will remain here.

Books, educational, and other HBJ divisions will relocate to Sea World property in Orlando by the end of 1984. Yes, Shamu is related to *Weeds Trees & Turf*.

Since this occurred in February when the temperature was less than freezing, you might understand a little interest on our part in moving to sunny Florida. As much as we travel it really doesn't matter anyway.

Hawaii Is Popular 82 Show Location

Four industry associations will hold their annual meetings in Hawaii this year. The National Arborist Association and the American Sod Producers led the way in February and March on Maui. The American Association of Nurserymen and the American Society of Landscape Architects meet in Hawaii this summer.

I can vouch that Hawaii is a heavenly place. Somehow, it doesn't make sense under the current recession and building crunch to have meetings so far away. It suggests the real purpose of an annual meeting is to play. Maybe learning shows are passe.

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GREEN INDUSTRY NEWS

GCSAA SHOW

Superintendents' Show Super Successfull

Over 7400 golf course superintendents and related industry personnel trekked to New Orleans to participate in the GCSAA Turfgrass Conference and Trade Show. Both the host city and the conference lived up to expectations.

Many superintendents and exhibitors took advantage of the Bourbon Street locale. On any evening of the week-long show, superintendents could be spotted doing their best to bolster the New Orleans economy by dining at Antoine's, Galatoire's or The Andrew Jackson or sipping Hurricanes (a local potable) at Pat O'Brien's. Some exhibitors customized their promotions to tie-in with the local atmosphere. Rain Bird Sprinkler Mfg. Corp., Glendora, CA, offered horse-drawn carriage tours and brochures of the French Quarter. Rhone-Poulenc Chemical Co., Monmouth Junction, NJ, sponsored an evening at the club of the famous jazz trumpeter Al Hirt.

Early arrival was encouraged and the show profitted from good attendance at the day-long pre-conference seminars on Saturday and Sunday. While the opening session was planned for Monday and the trade show for Tuesday, over 200 guests of the Marriott Hotel (many of whom were superintendents) received a 6 am wake-up call Sunday morning from fire engines battling a blaze adjacent to the hotel. The fire was quickly brought under control and though the Marriott suffered minor smoke damage to its facade, the greatest loss to the guests seemed to be a good night's sleep. For those guests who managed to sleep through the cacophony of the early morning fire engines, a fresh crew of firemen tracked through the lobby to douse a small fire in the trash chute later in the day.

With the pre-conference activities anything but dull, the opening session got off without a hitch. The Grand Ballroom of the New Orleans Hilton was filled to near capacity by 9 a.m. as the audience applauded the GCSAA awards presentation. Paul Voykin, golf course superintendent of Briarwood Country Club, Deerfield, IL, received the Leo Feser Award for his article, "Overgrooming is Overspending." Additionally, editors of 12 newsletters published by the association's chapters received Chapter Newsletter Editor Awards. For outstanding service to the golf course superintendent's profession, Distinguished Service Awards were presented to Milton Bauman, GCS, Seattle Golf Club; Sherwood Moore, GCS, Winged Foot Golf Club, Mamaroneck, NY; Al Radko, retired national director of the USGA Green Section; and Ben Warren, founder of Warren's Turf Nurseries.

The highlight of the opening session was the keynote address delivered by Jim McKay, ABC-TV sportscaster. An avid golfer who also anchors ABC-TV's golf telecasts, McKay explained to the crowd that he views the superintendent's job as an art. "I appreciate the art of what you do," said McKay. "In golf, the surface plays a more important part in the game than in almost any other sport." He regaled the audience

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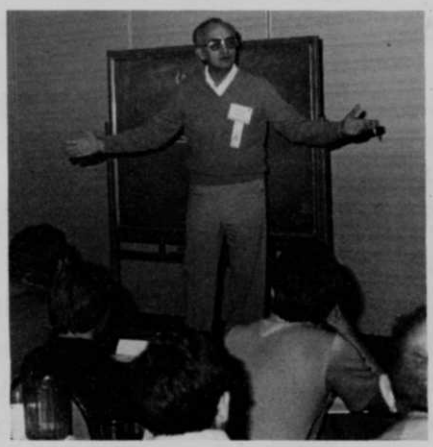

Ron Fream's seminar on employee motivation.

Sunday morning fire next to New Orleans Marriott Hotel.

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WTT 32

GOLF UPDATE

ASGCA predicts increase in construction

The American Society of Golf Course Architects expects the number of new golf courses started in 1982 to exceed those of the past year due to increasing demand and declining interest rates. "Studies show that more seniors and women are playing golf than ever before," President Dick Nugent stated, "and the nation's architects are responding by making the courses more versatile through the use of multiple tees and other design techniques."

Nugent believes that there is a pent-up demand for all types of golf courses—development, resort, municipal, public fee, and executive. "The architect has been able, in many instances, to take 'unusable' land and create a challenging course," the ASGCA president noted, "and we will see more creative work done on landfills, abandoned strip mines, flood plains, hilly areas, and other sites not previously considered for golf courses."

Nugent said that the architect must create a delicate balance between aesthetics and easy maintenance. In many cases, he pointed out, newer courses will have a more natural look. By leaving seldom-used areas in native grasses or flowers, courses are easier to maintain and present new challenges to the player. "Wall-to-wall green is not necessary for a great golf course," Nugent said. "Just take a look at the famous courses in Scotland."

Water availability is an increasing problem for golf courses across the country, particularly in the West, and Nugent predicts that more new and existing courses will be using effluent water for irrigation. "Many courses are tying into local water treatment plants to satisfy their needs and eliminating the need for local municipalties to release wastewater back into streams and lakes," Nugent added.

New Hampshire supers hold turf show

Despite inclement weather, the New Hampshire Golf Course Superintendents Association had a large turnout for their Turf Conference and Trade Show in Bedford, NH. Association President Barrie Robertson awarded the distinguished service award to Lou Douval, York, ME, Golf and Tennis. Ray Richard and Jim LaMorder, students at the University of Massachusetts winter turf school, received the annual scholarship awards.

The guest speakers included Dr. Stanley Swier who spoke on the current gypsy moth plague in the Northeast, Dr. Richard Skogley, University of Rhode Island, who spoke on topdressing, and Dr. Joseph Vargas, University of Michigan, who described the various diseases observed during the past year.

Cornish Wins Ross Award

Geoffrey S. Cornish, one of North America's leading golf course architects and co-author of "The Golf Course", has been named the 1982 winner of the Donald Ross Award presented annually by the American Society of Golf Course Architects to a person who has made significant contributions to the game of golf, especially golf course architecture.

Cornish received the Donald Ross award, named in honor of the "father of American golf course architecture," during the ASGCA annual meeting at the Breakers Hotel in Palm Beach, FL., February 22.

Previous recipients of the Donald Ross Award include Robert Trent Jones, Herbert Warren Wind, Herb and Joe Graffis, Joe Dey, Gerald Micklem, and Gov. James Rhodes of Ohio.

with entertaining anecdotes from his coverage of golf and the Olympic Games. Proving to be a personable celebrity, McKay spoke with many of the superintendents prior to his address and then ended his talk with an extended question-and-answer period.

ABC Sportscaster Jim McKay.

Twelve of the nation's leading experts on water and golf trotted out their views during the Water Symposium held Monday and Tuesday afternoon. Many of the superintendents appreciated the opportunity to hear an expanded discussion of such an important topic. "The main reason I come to this show is the seminars and the Water Symposium was better than I expected," said Larry Pakkala, superintendent at St. Andrews Country Club, Scarsdale, NY.

On Monday evening the Grand Salon of the Hilton was the site of the show's Mardi Gras reception. Frankie Mann and a host of local jazz artists treated the packed house to a number of New Orleans-style tunes. When the band hit its final note the real show was just beginning. Much to everyone's surprise and delight, the salon was transformed into a mini-French Quarter replete with harlequins and Mardi Gras paraders. Kings, queens, dukes and fair maids strutted amidst the crowd tossing trinkets. Their glittering outfits (part Las Vegas showgirl, part peacock) were a sight to behold, particularly to New Orleans newcomers.

Following the revelry of the previous evening, Tuesday morning brought on the brass tacks of the conference — the trade show. A sea of superintendents gathered for the 9 a.m. ribbon cutting and flooded the exhibit hall when the

Continues on page 14

Long lasting crabgrass control just takes one application.

Whether for bluegrass, fescue, bentgrass, or Bermudagrass, it's a fact that more turf care professionals demand Betasan® herbicide over any other brand.

The simple reason. Betasan delivers the maximum amount of crabgrass control with a minimum amount of effort.

Just one application at labelled rates stops crabgrass before it starts. Stops it without hurting established turf. And stops it in most of the U.S. all season long.

That's the furthest man has come in fighting crabgrass. But you don't have to go far for your own supply. Just to the distributors listed here.

They've all put Betasan into their own herbicide products. Because they want to bring turf care professionals the ultimate in protection against crabgrass.

Follow label directions. Stauffer Chemical Company, Agricultural Chemical Division, Westport, CT 06881.

Stauffer CHEMICALS

® T.M. of Stauffer Chemical Company.

Firm	Brand Name	Sales Area
Agway, Inc. Syracuse, New York	Betasan 7-G	Northeast
The Andersons Maumee, Ohio	Betasan plus fertilizer	Midwest
Balcom Specialty Products Greeley, Colorado	Clean Crop Betasan 4-E and 7-G	National
Faesy & Besthoff, Inc. Edgewater, New Jersey	F & B Betasan 4-E, 3.6-G and 7-G	Northeast
Lakeshore Equipment and Supply Co., Inc. Elyria, Ohio	Lescosan 4-E,12.5-G and 7-G Betasan plus fertilizer	National
Lebanon Chemical and Fertilizer Corp. Lebanon, Pennsylvania	Lebanon Betasan plus Fertilizer, 4-E and 7-G	National

Firm	Brand Name	Sales Area
Mallinckrodt, Inc. St. Louis, Missouri	Pre-San 4-E, 12.5-G and 7-G	National
Occidental Chemical Co. Lathrop, California	Best 4-E and 12.5-G	West Coast Southwest
PBI Gordon Corp. Kansas City, Kansas	Betamec-4	National
Pratt-Gabriel Div. Miller Chemical and Fertilizer Co. Robbinsville, New Jersey	Pratt 4-E, 12.5-G, 7-G	Northeast
Pro-Lawn Products, Inc. Syracuse, New York	Betasan 7-G	Northeast
Rockland Chemical Co. West Caldwell, New Jersey	Rockland Betasan 4-E, 12.5-G and 7-G Betasan plus fertilizer.	Northeast

Circle No. 153 on Reader Inquiry Card

LANDSCAPE UPDATE

ASLA institutes "return of dues" program

The American Society of Landscape Architects has instituted a new membership benefit for 1982 termed the Return of Dues Program. All national dues paid by each member after the program begins will be returned to the member at age 70 or to the member's estate upon death. The amount will be returned as long as continuous membership in ASLA is maintained.

The Return of Dues Program will be provided for all dues-paying Fellows, Members, Associates and Affiliates at no additional expense to each member. ASLA will pay all costs. Accrual of benefits will begin at the first renewal of membership. First year dues submitted with an application will not apply. If membership is dropped for any reason or dues are not submitted, the member will lose all claim to amounts accrued at that time. Upon re-entering ASLA, members will begin accruing return of dues credit from zero.

In other ASLA news, the Society has moved to its new headquarters. The new address, effective immediately, is: ASLA, 1733 Connecticut Avenue, N.W., Washington, DC 20009.

ALCA elects officers for 1982

The officers of the Associated Landscape Contractors of America were elected at its Annual Membership Meeting held recently at the Riviera Hilton, Palm Springs, CA. Ray Gustin automatically moved up to president, having served as president-elect for the past year. Gustin is president and owner of Gustin Gardens.

Other officers elected were: president-elect, David Pinkus, North Haven Gardens, Dallas, TX; vice presidents, Landon Reeve, Chapel Valley Landscape, Woodbine, MD; and Rodney Bailey, Evergreen Services Corp., Bellevue, WA; treasurer, Irvin Dickson, ChemLawn, Atlanta, GA; and secretary, Karl Korstad, Sedgefield Interior Landscaping, Greensboro, NC. 1981 President Allen Keesen automatically became immediate past president.

Executive Director Alan Smith commented that the meeting featured "the most aggressive seminar program of ALCA to date, particularly the interior sessions." Smith also noted that attendance was higher than anticipated.

IPA launches Media Year

The Interior Plantscape Association has declared 1982 as its Media Year. The underlying theme for the year is "The Interior Plantscape Specialist . . . the Professional Difference." The thrust of the campaign is to acquaint the public as well as designers, architects and landscape architects with the specifics of the job done by interior plantscape professionals.

Media Year is a promotional vehicle created for plantscape specialists as well as IPA. In the past year the association coined the phrase "The Interiors Team" to publicize that plantscapers be included in the roster of individuals who contribute to the design and well-being of a building. IPA is currently discussing plans to set up a committee of marketing experts that would evaluate the effectiveness of members' marketing plans that are submitted. A nationwide competition (with winning plans displayed at the Fourth Annual IPA Meeting in Portland in October) is also underway.

To publicize the plantscaping profession, officers and staff of IPA will be attending meetings, explaining association programs and offering to exchange speakers and information. A speaker's pool has been formed to address the various interested related professional on such topics as the aspects of interior plantscaping for designers and plantscaping for architects.

doors opened. The Riverside Convention Center proved to be a fine showcase for the 212 turf, chemical and equipment exhibitors. Superintendents continually filled the hall. Exhibitors were seen answering inquiries and transacting business right up to the Thursday 2 p.m. closing time. Some exhibitors, however, believed that the aisles were narrower than in previous years and those companies relegated to the mini-hall across from the main show floor received noticeably less superintendent traffic.

Part showgirl, part peacock.

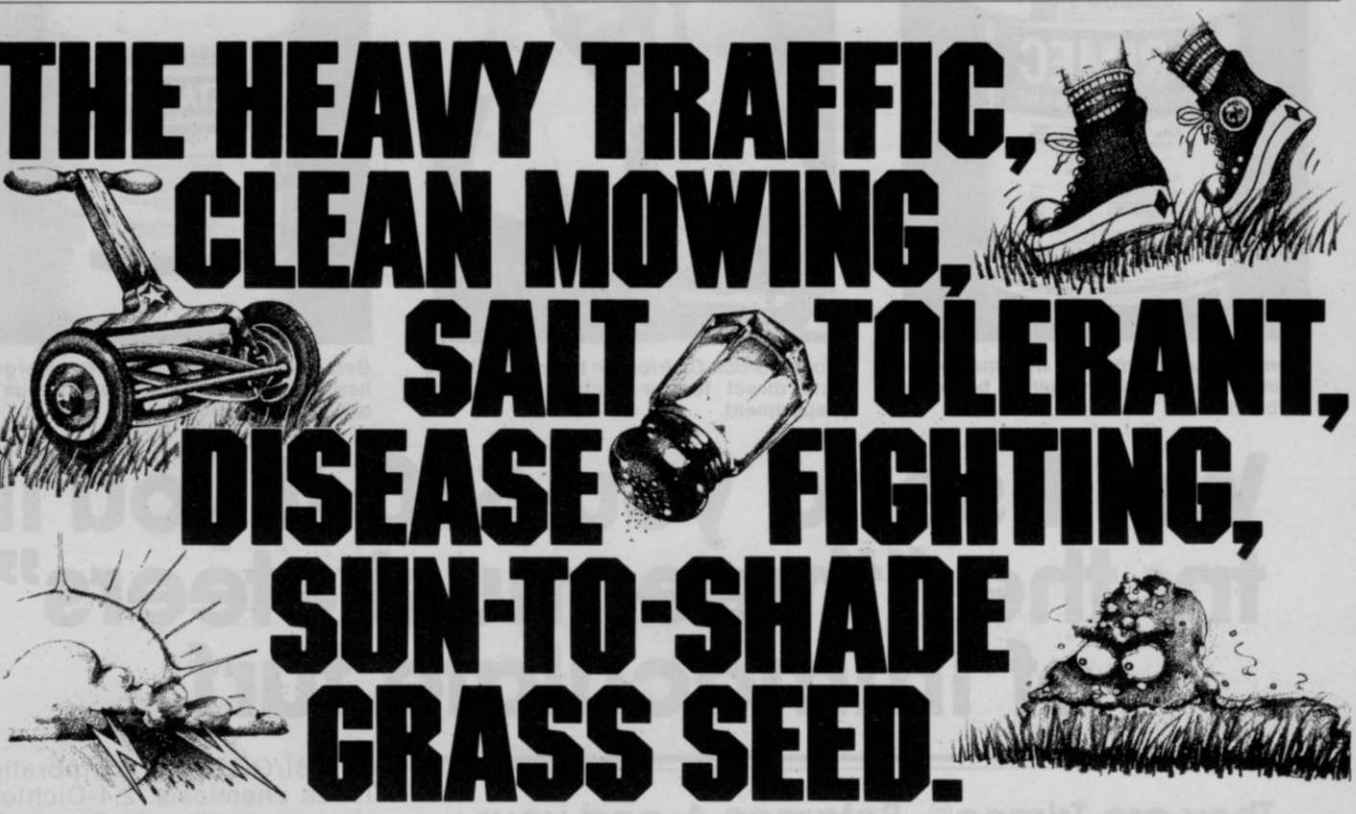
One of the major traffic builders for some exhibitors was *Weeds Trees & Turf's* "Long Green Sweepstakes." Ten companies (BFC Chemicals, Dow Chemical USA, Mobay Chemicals, Milwaukee Sewerage Commission, RainBird Sprinkler Mfg., Ransomes, Safe-T-Lawn, Standard Golf, Stauffer Chemical, and Vandermolen) participated in the sweepstakes and many of them had superintendents lined up waiting to fill out entry blanks. The $1000 first prize was won by Keith Scott, Oak Ridge Golf Club, Hopkins, MN. Scott registered at the Ransomes booth. Gary Stafford, Cardinal Golf Club, Greensboro, NC, picked up the $500 prize (Stauffer Chemical booth); while Paul Latshaw, Oakmont Golf Club, Oakmont, PA, won $250 (Safe-T-Lawn booth).

For the second year in a row the USGA Green Section held its Educational Conference in conjunction with the GCSAA show. At the conference (held Wednesday, 9 a.m. to 2:30 p.m.) it was announced that William Bengeyfield has stepped in to fill the shoes of the retiring Al Radko as national director of the Green Section. The theme of the conference was "The Good Earth Needs Good Golfing Turf" and the

Continues on page 18

NORTHRUP KING PRESENTS

THE HEAVY TRAFFIC, CLEAN MOWING, SALT TOLERANT, DISEASE FIGHTING, SUN-TO-SHADE GRASS SEED.



No one grass seed combines every characteristic for every type of turf. That's why Northrup King research has developed a complete line of Medalist Turf Products to meet specialized professional needs.

MEDALIST TURF PRODUCT	MAJOR AREAS OF USE	SPECIAL FEATURES
Athletic Pro Mix	High maintenance athletic turf	Both are well suited for new seeding or overseeding. Fast establishing, excellent traffic tolerance, and rapid recovery. Provides good footing.
Athletic Pro II Mix	Low to moderate maintenance athletic turf.	
Boulevard Mix	Any area with high pH (roadsides, sidewalks, boulevards, beachfronts, etc.)	Contains both "Fults" *Puccinellia distans* and Dawson red fescue which thrive on high saline or alkaline soils. Performs at low to high fertility levels.
Landscape Pro Mix	School grounds, cemeteries, golf course roughs, lawns	Fast establishing. Adapts to broad range of conditions and management levels. Low to moderate fertility requirements.
Overseeder II Mix	Fairways, tees, athletic fields	Fast establishing, traffic tolerant, disease resistant, penetrates compacted soil.
Overseeder III Mix (Formerly Medalist North Mix)	Fairways, tees, cart paths, wear areas	Long term quality in high traffic areas. Clean mowing and disease tolerant.
Premium Sod Blend	Commercial sod producers	Fast establishing, exceptional dark green color, shade tolerant, superior disease resistance.
Special Park Mix	Parks, commercial developments, lawns	Low fertility tolerance, shade tolerant, adapts to wide range of soil types.

Ask your Northrup King distributor about the Medalist Turf Products for your needs. Or write Northrup King Medalist Turf Products, P.O. Box 959, Minneapolis, MN 55440.

MEDALIST TURF PRODUCTS

Circle No. 141 on Reader Inquiry Card

Trimec® Turf Herbicide: **the undisputed champion of post-emergence broadleaf herbicides.**

Your Gordon Distributor: **he has a toll-free line direct to our Technical Services department.**

Betamec-4: **the premier pre-emergence herbicide for crabgrass, poa annua and other grassy weeds.**

We'll send you $10 if you'll try the "three musketeers" of immaculate turf.

They are Trimec®, Betamec-4, and your Gordon Distributor. Together this trio can make you and your turf look good.

In this day and age, the search for bargains is a way of life. Even professional turfmen are caught up in the current. True, your primary objective is to achieve immaculate, pristine, weed-free turf. But somewhere in the background is the man with the checkbook who wants you to operate within a budget.

Such budget pressures can tempt even the most professional of the professionals to toy with the thought of cost per gallon rather than cost per acre of immaculate weed-free turf.

So if it's money you're thinking about, we're not adverse to sending you a little of it if you'll let us prove to you that, dollar-for-dollar and acre-for-acre of immaculate weed-free turf, it's still cheaper to go first class.

Specifically, we'll send you a check for $10 if you'll try Gordon's "three musketeers" of immaculate turf: Trimec; Betamec-4; and your Gordon turf distributor.

Why crabgrass and poa hate Betamec-4

Betamec-4 is unparalleled in the field of selective pre-emergence herbicides, and is preferred by turf specialists who want dependable results. Consider just a few of its unique advantages.

... It has an extended life, which means you can apply it on *your* time table rather than nature's germination schedule. Can be applied in the fall or early spring for all-season control.

... Because it's a liquid it stays in place, and thus is effective over an entire terraced area of turf.

... And it is so gentle to established turf and around herbaceous ornamentals. It has been applied at twice the recommended rate without causing damage.

How Trimec saves you time and money

Trimec is unparalleled in the field of selective post-emergence herbicides. It is a patented herbicide No. 3,284,186 manufactured by PBI/GORDON Corporation. Three chemicals: 2,4-Dichlorophenoxy acetic acid, 2-methyl-4-Chlorophenoxy propionic acid; and 3,6-dichloro-o-anisic acid are all reacted as acids to form the dimethylamine salt of Trimec. The resulting Trimec product has unparelleled strength caused by the synergism that occurs from reacting the three acids.

And yet, the cost per acre is low because the synergistic action of Trimec is fully effective with a small amount of chemical which translocates to the root system, resulting in a high degree of kill.

A friend in need is a friend indeed

The third member of the team is your Gordon Professional Turf Distributor. He will not only provide you with Betamec-4, Trimec, and a complete line of turf chemicals at a price that will leave you plenty of room to breathe. He will also back you up with technical knowledge to help you solve — or avoid — the problems that plague the professional turfman.

Go to any of the Gordon distributors listed on the opposite page and order five gallons of Betamec-4 and five gallons of Trimec. Get an invoice proving purchase and send it with the coupon. We'll send you a check for $10.

Gordon's Authorized Distributors:

ALABAMA
Birmingham
• Norala Company • Tieco, Inc.
Gadsden • Markers of Clubview
Montgomery • CASSCO • Tieco, Inc.

ALASKA
Palmer • Alamasu, Inc.

ARIZONA
Phoenix • Arizona Agrochemical Co.
• Capital Nursery Supply
• Target Chemical Co.
Tucson • A.C.R.E., Inc.

ARKANSAS
Alexander • Capitol Equipment Co.
North Little Rock • Turf Aid, Inc.
Searcy
• Affilliated Growers & Retailers of Agriculture, Inc.

CALIFORNIA
Anaheim • Robinson Fertilizer Co.
Bakersfield
• Abate-A-Weed & Insect Control
Cerritos • Target Chemical Company
Chula Vista • Wilbur-Ellis Company
Coachella • Foster-Gardner, Inc.
Fillmore • Coastal Division
Fremont • El Camino Supply Co.
Fresno • Target Chemical Company
Los Angeles • Van Waters & Rogers
Manteca • L & A Enterprises
Oxnard • Coastal Division
Sacramento • Orchard Supply Co.
San Diego • Butler's Mill, Inc.
San Gabriel • J. Harold Mitchell Co.
San Jacinto • Coastal Division
San Jose • Moyer Chemical Co.
• Northern California Fertilizer Co.
• Plant Gro Corporation
• Target Chemical Company
• Van Waters & Rogers
Santa Ana • Moyer Chemical Co.
Santa Barbara
• Agri Turf Supplies, Inc.
Santa Rosa
• Purity Chemical Products Co.
South Gate
• Los Angeles Chemical Company
Stockton • Castle of Stockton

COLORADO
Colorado Springs • Gorby, Inc.
Denver • Van Waters & Rogers
Henderson • American Fertilizer Co.
Pueblo • Pueblo Chemical & Supply
Westminister • S.A.J. Turf Products

CONNECTICUT
Devon • Somers Turf Supplies
East Haven
• East Haven Wholesale Landscape Supply
Greenwich
• Emanuel Shemin Horticulturist
Hazzardville • Old Fox Chemical, Inc.
Wethersfield • Chas. Hart Seed Co.

FLORIDA
Homestead
• Atlantic Fertilizer & Chemical
Jacksonville • Bingham Seed Co.
Pensacola
• Gulf Shore Turf Supply, Inc.
• Tieco Gulf Coast, Inc.
Princeton • Woodbury Chemical Co.
Sanford • Southern Chemical Co.
• Sunniland Corporation
Tampa
• Southern Mill Creek Products Co., Inc.
Winterhaven • Estech, Inc.

GEORGIA
Alpharetta • Regal Chemical Co.
College Park
• Stephenson Chemical Company
Conyers • Lawn & Turf, Inc.
Doraville
• Georgia Golf & Garden Supply
Fort Valley
• Woolfolk Chemical Work, Inc.
Madison • Pennington Seed, Inc.
Norcross
• Managed Environments, Inc.
Swainsboro • GA AG Chemical, Inc.

HAWAII
Honolulu • Trade West, Inc.
• Van Waters & Rogers

IDAHO
Boise • Van Waters & Rogers
Caldwell • Good Day Distributors
• Steven Regan Company

ILLINOIS
Barrington • Olsen Distributing Co.
• Rowlands Equipment
Chicago • George A. Davis, Inc.
Danville • Bi-State Turf
Decatur
• Drake-Scruggs Equipment, Inc.
Evanston • Permalawn, Inc.
Geneseo • C. D. Ford & Sons
Morton Grove • V-G Supply Company
Normal • Professional Turf Specialty
Peoria • Behm & Hagemann, Inc.
Rockton • Turf Management Supply
South Holland • Paarlberg Chemical
West Chicago • Turf Products Ltd.
Wheeling • Arthur Clesen, Inc.

INDIANA
Indianapolis • Cory Orchard Supply
• Desco Chemical Company
• Indiana Turf
Nappanee • Desco Chemical, Inc.

IOWA
Cedar Rapids • Hawkeye Seed Co.
Davenport • Big Bear Turf Equipment
• Tri State Toro
Elkader • Meyer Equipment Co.
Sioux City
• W. R. Anderson Distributing Co.
Waterloo • Foster's, Inc.
Waukee • Baer Ag Supply
W. Burlington
• Brayton Chemical, Inc.
W. Des Moines • Big Bear Turf Co.
• Rest Haven Turf Service

KANSAS
Garden City • Pueblo Chemical Co.
Kansas City
• Century Laboratories, Inc.
• Rhodes Chemical Company
Salina • Landsco Corporation
Wichita
• Bartels & Shores Chemical Co.
• Champion Turf Equipment, Inc.
• Robert Wise Company

KENTUCKY
Florence • George W. Hill Company
Lexington • Kentucky Garden Co.
Louisville • Ky-Inna Turf Supply Co.
• Central South Turf Distributors
• Tieco

LOUISIANA
Covington
• Tammany Turf & Supply, Inc.
New Orleans
• Southern Specialty Sales Co., Inc.
Plain Dealing
• Wyche's Golf Course Specialties

MAINE
South Portland • Yerxa's, Inc.

MARYLAND
Baltimore • Pro-Lawn Products, Inc.
Landover • Loft Seed Company
• Vaughan Seed Company
Linthicum Heights
• Cornell Chemical & Equipment

MASSACHUSETTS
Arlington • Lofts/New England
Boston • Pro-Lawn Products, Inc.
Burlington • Tom Irwin, Inc.
Natick • Richey & Clapper, Inc.
Newton Center
• Grounds Equipment Company
W. Newton • The Clapper Company
W. Wareham
• R. F. Morse & Son, Inc.

MICHIGAN
Birmingham • W. F. Miller Company
Detroit • Terminal Sales Corporation
• Turf Supplies, Inc.
Grand Rapids • Mollema & Son, Inc.
• Parmenter & Andre
Hartford • Desco Chemical Company
Royal Oak • Lawn Equipment Co.
Saginaw • Burdick's Seed House
Utica • Utica Distributors

MINNESOTA
Eagan • Tessman Seed & Chemical
Hopkins
• Potter & Manthei Enterprises
Minneapolis • Howe Chemical Co.
• Minnesota Toro, Inc.
St. Paul • R. L. Gould & Company
• Turf Supply Company
Savage • The Castle Chemical Co.

MISSISSIPPI
Jackson
• South Central Turf Equip. & Supply
• Specialty Oil Company, Inc.
Madison • MFC Services

MISSOURI
Chesterfield
• Beckman Turf & Irrigation
Grandview • Landsco Corporation
• Robisons Lawn & Golf Course Supply
Kansas City
• Bartels & Shores Chemical Co.
• Champion Turf Equipment
• Colony Chemicals
• Pest Control Supply
• Standard Seed Company
• Tobin Seed
Maryland Heights
• Outdoor Equipment Company
Springfield
• Champion Turf Equipment, Inc.
St. Louis • Crown Chemical Co.
• A. H. Hummert Seed Company
• Link's Nursery, Inc.

MONTANA
Billings • Turf Aid Distributing Co.

NEBRASKA
Kearney • Growers Ag Service Special Products Group
Morrill • Jirdon Agri Chemical, Inc.
McCook • Cornbelt Chemicals
Omaha • Big Bear Equipment, Inc.
• Eagle Green Corporation
• Midwest Toro

NEVADA
Las Vegas
• Clark County Wholesale Merc. Co.
North Las Vegas
• Las Vegas Fertilizer Co., Inc.

NEW HAMPSHIRE
Hooksett • Turf Specialty, Inc.

NEW JERSEY
Boundbrook • Loft Seed Company
• Vaughan Seed Company
Cranbury
• Chamberlin & Barclay, Inc.
Clifton • The Terre Company
Dayton • Lebanon Chemical Corp.
Freehold • Green Hills Turf Supply
Hillsdale • L.S.T. Industries
Maplewood • Pierson Mill Company
Mountainside • Andrew Wilson, Inc.
Paramus • Pro-Lawn Products, Inc.
Rahway • Fertl-Soil Company
Riverside • Meskers, Inc.
Shrewsbury • Raycroft Distributors
West Caldwell
• Rockland Chemical Company
Westfield • Storr Tractor Company
Yardville • Jep Sales Company

NEW MEXICO
Albuquerque
• Albuquerque Chemical Co., Inc.
Mesquite • Agricultural Products Co.
Roswell
• Roswell Seed Company, Inc.

NEW YORK
Bergen • Lawn Medic
Brewster • Herbst Bros.
Cambridge • Lofts/New York
Cohoes • S. V. Moffett Co.
Dix Hills • Island Golf & Turf
Farmingdale • Wagner Seed Co, Inc.
Hamburg • Eaton Equipment Co.
Hauppauge • Maxwell Turf, Inc.
Hawthorne • Metro Milorganite
Jamaica • J & L Adikes, Inc.
Latham
• Grassland Irrigation & Equipment
Lincolndale
• Westchester Turf Supply Co.
Syracuse • Eaton Golf & Tractor
• Pro-Lawn Products, Inc.
South Hampton
• James H. Lynch, Inc.
West Henrietta • S. V. Moffett, Inc.

NORTH CAROLINA
Charlotte • E. J. Smith & Sons
• Forshaw Chemicals
• Seedmen, Inc.
Fayetteville • Eastern Turf
Goldsboro • Jeffreys Seed Company
Shelby • Porter Brothers, Inc.
Winston-Salem • Goltra, Inc.

NORTH DAKOTA
Fargo • Minnesota Toro
• Tessman Chemical Northwest

OHIO
Canton • Letherman Seed Company
Cleveland • Larry's Garden Center
• U. S. Garden Sales, Inc.
Cincinnati • Century Toro Dist., Inc.
• Forshaw Chemicals
• Thornton Environmental
Dayton • G & S Supply Company
Elyria
• Lakeshore Equipment & Supply Co.
Findlay • Desco Chemical Company
Macedonia
• Krigger & Company, Inc.
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Maumee • The Andersons
Piqua
• Midwest Burlap & Growers Supply
Solon • Sidney L. Dryfoos Company
Tiffin • Earl J. Crane, Inc.
Toledo • Century Toro Dist.

OKLAHOMA
McAlester • Tony's Chemical House
Oklahoma City • Paul Blakney Co.
• Estes Chemicals, Inc.
• T-E Agri Supply, Inc.
Tulsa • All Best, Inc.
• Nick Knott Turf Equipment
• South Central Vet Supply
• Thompson-Hayward Chemical Co.
• Wait Mfg. & Sales Company

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Portland • The Chas. H. Lilly Co.
• Van Waters & Rogers
• Wilbur-Ellis Company

PENNSYLVANIA
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Forty Fort • Penn State Seed Co.
Hanover
• Miller Chemical & Fertilizer Corp.
Harleysville • Geiger Corporation
Horsham • Pocono Turf Supply Co.
Lebanon • Lebanon Chemical Corp.
Malvern
• Fisher & Sons Company, Inc.
Manheim • Pro-Lawn Products, Inc.
Philadelphia
• Farm & Golf Course Supply Co., Inc.
• Pro-Lawn Products, Inc.
Phoenixville • Lawn & Golf Supply
Pittsburgh • E. H. Griffith, Inc.
• Krigger & Company
• Pro-Lawn Products, Inc.
Reading • Reading Bone Fertilizer
Wycombe • Histand Supply

RHODE ISLAND
E. Providence
• Old Fox Chemical, Inc.

SOUTH CAROLINA
Inman
• Woolfolk Chemical Works, Inc.
Orangeburg
• Ramar Laboratories, Inc.

SOUTH DAKOTA
Sioux Falls • C & R Supply
• Dakota Turf

TENNESSEE
Knoxville • Central South Turf Dist.
Memphis • The January Company
• Turf Aid, Inc.
Nashville • Central South Turf Dist.
• Ernest Hardison Seed Co., Inc.
• Tieco, Inc.

TEXAS
Amarillo • T-E Agri Supply
Dallas
• Agricultural Chemicals of Dallas
• Chemical & Turf Specialty Co.
• Nortex Wholesale Nursery
• Van Waters & Rogers
• Watson's Distributing Company
El Paso • El Paso Turf Supply
Houston • Van Waters & Rogers
• Watson's Distributing Company
Katy • Sigma Chemicals
San Antonio
• Van Waters & Rogers
Waco • Estes Chemicals, Inc.
Wichita Falls • Estes Chemicals, Inc.

UTAH
Salt Lake City • Steve Regan Co.
• Van Waters & Rogers

VIRGINIA
Chesapeake • Turf & Garden Division
Harrisonburg • Wetsel Seed Co.
Richmond • Forshaw Chemicals
• Wilson Feed Company, Inc.
Roanoke
• Agri Turf Products Company, Inc.
• Miller Chemical & Fertilizer Co.

WASHINGTON
Pasco • Wilbur-Ellis Company
Renton • Pacific Agro Company
Seattle • The Chas. H. Lilly Co.
• Van Waters & Rogers
• Wilbur-Ellis Company
Spokane
• Van Waters & Rogers
• Wilbur-Ellis Company
Tacoma • NuLife Fertilizers

WASHINGTON, D.C.
• Lea's Green Meadow, Inc.

WEST VIRGINIA
Charleston • Young's, Inc.

WISCONSIN
Chilton • Horst Distributing Co.
Elm Grove
• Reinder Bros. Turf Equipment
Janesville • Wisconsin Turf
Milwaukee • Loft Kellogg Seed Co.
Sun Prairie
• Turf Management Supply

Betamec-4 (Betasan — registered trademark of Stauffer Chemical Co.)

TRIMEC® is a registered trademark of PBI/GORDON Corporation. Product covered by U.S. Patent No. 3,284,186.

$10 COUPON

Send to PBI/GORDON Corporation

Attached is an invoice from a Gordon Distributor listed on this page, proving that I have purchased 5 gallons of Betamec-4 and 5 gallons of Trimec since January 1, 1982. Please send me a check for $10.00. (Offer expires July 1, 1982. Limit one per customer.)

$10

Name

Address

City State Zip

GORDON'S

PROFESSIONAL TURF PRODUCTS

pbi/gordon corporation

1217 WEST 12TH STREET
P.O. BOX 4090
KANSAS CITY, MO 64101
816/421-4070

GOVERNMENT UPDATE

BY WILLIAM HOFFMAN

Marijuana—An important agricultural crop?

It doesn't matter whether you believe the National Organization for the Reform of Marijuana Laws figure of an $8.2 billion crop of homegrown pot in 1981 or the United States Drug Enforcement Administration's lesser figure, the value of marijuana is nearing the value of the major crops of soybeans, corn and wheat. Cannabis indica, a Far East variety has replaced the native cannabis sativa, because it produces as much as two pounds of dried product per plant and one richer in tetrahydrocannabinol, the intoxicating chemical. Wild animals and poachers appear to be greater threats to the plantings than law enforcement agencies.

Import of rooted hyacinth bulbs now allowed

In 1980, during the revision of the import regulations for nursery stock, plants, roots, bulbs, seeds and other plant products, the importation of ferns, African violets, gloxinia, begonia and peperomia in soil-free growing media was allowed. Stringent conditions were required in order to prevent the entry of injurious plant diseases, insects or other pests into the United States. The Animal and Plant Health Inspection Service, USDA, is now adding hyacinths to the list. The soil-less media would be unused peat, sphagnum moss, vermiculite, or synthetic plastic materials. They estimate that not more than 20,000 rooted hyacinth bulbs would enter the first year—a small amount when compared with the 25 million hyacinth bulbs imported each year.

Fertilizer and limestone use up slightly

Fertilizer use in the United States for the year ending June 30, 1981 totaled 51.2 million tons, an increase of one percent from the tonnage consumed in the previous year.

Dry, bagged fertilizer continued to decline while use of dry bulk mixtures and fluid fertilizer increased. The U.S. Department of Agriculture reported further that total 1981-82 use will be over 23 million nutrient tons-close to last year's level.

Overall fertilizer prices could average six to seven percent higher in the spring of 1982. Above normal inventories of phosphate and potash, plus a possibly stable demand, will hold back greater price increases.

The National Limestone Institute reported that limestone use for the year 1980 was about 34.4 million pounds, up about 10% from 1979 but still only about a third of the needs of our soils.

Pesticide applicator training in jeopardy

The House of Representative's Agriculture Subcommittee keeps an eye on the EPA administration of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and has reported out an amendment which is in direct opposition to White House plans. The amendment calls for the appropriation of $4 million each fiscal year to the States for applicator training and pesticide certification and licensing.

While this Subcommittee has no power to appropriate money for pesticide regulatory programs of EPA, there is the possibility of such a figure showing up in the Congressional EPA funding bill.

These programs are completely eliminated in the President's budget with the expectation that the State's will do the funding. A victory for the President could cause many of the States to reduce pesticide regulatory activities drastically. They feel that the certification and training of applicators and the classification of restricted use pesticides were enacted into law at the Federal level and should be funded at that level.

With no certified applicators, there can be no restricted use pesticides, seriously affecting the efforts of EPA to make available the chemicals needed for safe pest control.

NEWS *from page 14*

Green Section fielded 14 speakers to expound on irrigation, turf, design and playing conditions. During the conference Charles Wilson, retired director of the Milwaukee Sewerage Commission and current research director of the O.J. Noer Research Foundation, was awarded the 1982 USGA Green Section Award. The award was given in recognition of Wilson's distinguished service to golf through work with turfgrass.

Al Radko was awarded the first *Weeds Trees & Turf* "Man of the Year Award" during the show. *Weeds Trees & Turf* sought to recognize Radko for his 35 years of tireless achievements in golf course management. A member of the Green Section since 1953, Radko served as national director for the last five years.

Exhibitors had their own awards to present at the show. Smithco presented its "Smithco White Hat Award" to Illinois Lawn Equipment Co. as the Western Distributor of 1981. Boyd Distributing copped the "Outstanding Sales Performance Award" from Turfco Mfg. Co./National Mower Co.

The show came to a close with the election of GCSAA officers for 1982. James Wyllie, Bayview Golf Club, Brampton, Ont., was elected president. Other officers elected were: Robert Osterman, Connecticut Golf Club, Easton, CT, vice president; Paul Boizelle, The Onwentsia Club, Lake Forest, IL, executive committee; and John Hayden, San Jose Country Club, Jacksonville, FL, executive committee.

Showgoers register for Long Green Sweepstakes.

Power equipment sales to increase

Outdoor power equipment sales should increase during 1982, despite the present economic slowdown, according to the Homelite Division of Textron Inc., Charlotte, NC.

"We're starting to see a recovery in

the chain saw business and are projecting continued growth next year for gas-powered string trimmers," said George Algire, Homelite executive director of marketing. "We also see the trend continuing toward bigger and more expensive chain saw models that cut more wood and for longer periods of time."

Other Algire predictions include: gas-powered string trimmer sales to increase to 1.2 million from 1 million; the market for blower-sprayer units to double from 100,000 in four years; and a two to six percent increase in grass-cutting equipment sales.

CHEMICAL

Avon Products buys Mallinckrodt Inc.

Avon Products, the cosmetics firm, has reached an agreement to acquire Mallinckrodt Inc., St. Louis, MO. The purchase agreement amounts to $720 million ($50 per share of Mallinckrodt stock).

Mallinckrodt, a leading manufacturer of agricultural chemicals and other products, will be an independent subsidiary of Avon. No management changes have been planned and the company will continue to be based in its St. Louis headquarters.

In other news at Mallinckrodt, Mack Nichols has been elected corporate vice president. Nichols had been vice president and general manager of the company's Specialty Chemical division.

PEST CONTROL

IPM making progress using natural enemies

Integrated pest management (IPM) is making good progress in America, according to Lloyd Knutson, U.S. Department of Agriculture insect scientist.

Speaking at the First Japan-USA Symposium on IPM, Knutson said that IPM progress is due to advances by scientists who explore the world and never roam far from a microscope. He spoke of entomologists who learn to control pests of the farm and forests by using the pests' natural enemies—their parasites, predators and diseases.

Natural enemies and other biological control techniques are the "foundation" of IPM, said Knutson. Scientists developed the IPM concept in recent years to give people alternatives to relying solely on pest control by chemical pesticides. Knutson is chairman of

Continues on page 89

Turf Maintenance?

Let your grasses do the work

Turf problems can be avoided. Improved varieties are your lowest cost management tool.

If the turf area you manage is over 15 years old, chances are it is a mixture of poa annua, wild bentgrass and other questionable turf species.

Make your job easier and cut maintenance costs. Renovate and plant a mixture of improved turfgrass varieties like Touchdown and America Kentucky bluegrass and Fiesta Perennial ryegrass. All these have the ability to establish quickly, and produce a dense weed resisting turf. They will stand up to wear, turf diseases, and seasonal stress. Professional testing proves it.

University of Illinois - Touchdown was **outstanding** in its ability to out compete Poa annua.

Ohio State University - America **ranked first** out of 30 commercial bluegrass varieties in incidence of Sclerotinia Dollar Spot. (At low, medium, & high fertilization levels.)

Ohio State University - Fiesta **ranked number 1** out of 22 commercially available perennial ryegrasses in overall turf quality for entire season.

Touchdown
KENTUCKY BLUEGRASS

Fiesta
PERENNIAL RYEGRASS

AMERICA
KENTUCKY BLUEGRASS

Produced by
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PICKSEED WEST Inc.
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Pickseed Also Produces
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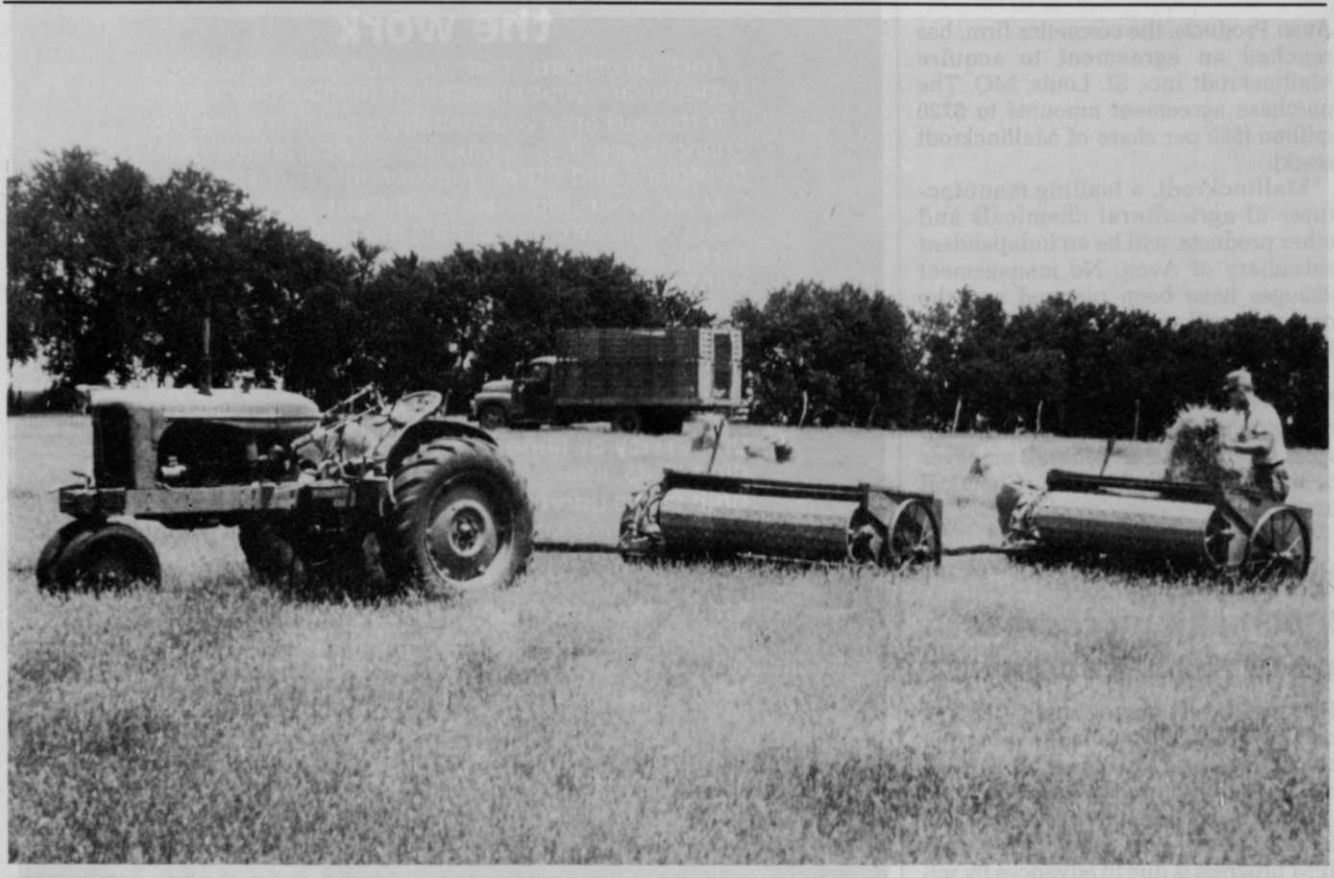
20th ANNIVERSARY

JACKLIN, VERMEER FOUND STRENGTH IN LANDSCAPING

To help us celebrate our 20th anniversary, we asked advertisers to share their last 20 years with us. Jacklin and Vermeer jumped at the opportunity. Although both companies were launched prior to 1962, they derived phenomenal growth as the landscape market boomed in the last 20 years. In future issues we will present the stories of other landscape market manufacturers to highlight the last 20 years.



Jacklin Seed Co. is a multifaceted company serving both the professsional and homeowner markets. It was founded in 1935 by Ben Jacklin and his three sons Lyle, Owen and Arden in Dishman, WA. Arden Jacklin, after leaving the USDA Soil Conservation Service, convinced his father and brothers to risk part of their vegetable farming business to venture into the turf seed industry.

Initially, Jacklin produced some field grasses and creeping red fescue. Later they received some of the first foundation seed of Merion and put full effort into production. Because of the ever-increasing demand for new and better grasses, Jacklin is committed to testing and developing improved varieties. The company makes its own new variety selections, in addition to testing new varietal developments by universities and industry. In Jacklin's trial grounds, more than 200 Kentucky bluegrass varieties plus fescues and other grasses are in test. Rated according to turf quality, color, density, texture, disease resistance, ability to withstand hard usage, and seed production

Continues on page 22

THESE INSECTS HAVE ONE THING IN COMMON

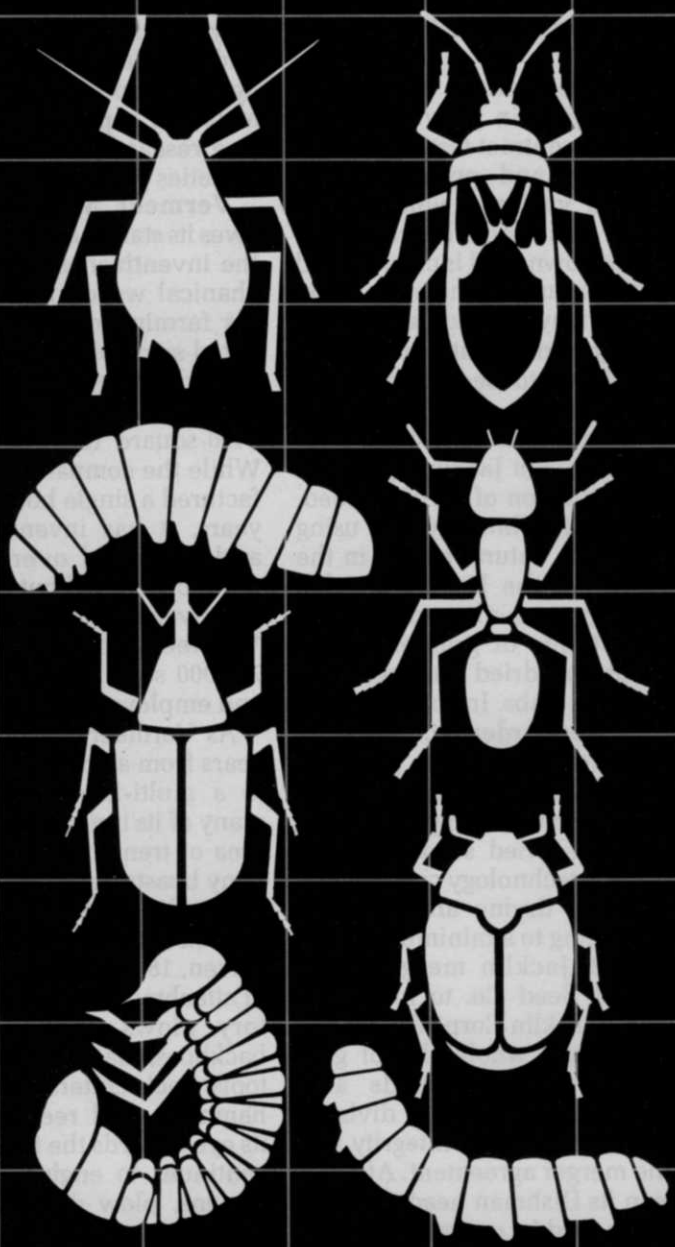
They now can be controlled by a NEW effective carbamate insecticide *TURCAM*®

TURCAM Insecticide offers the professional turf and ornamental care specialists a new effective broad spectrum insecticide for the control of a wide range of ornamental and turf pests including gypsy moth, Eastern tent caterpillar, certain scale insects and weevils, Japanese beetles, sod webworms, chinch bugs, mole crickets, white grubs and various nuisance pests such as fleas, wasps and fireants.

In addition to controlling these and many other pests, TURCAM

- Will not damage your ornamentals
- Will not get tied up in your turf thatch
- Is odorless
- Is suitable for use in Liquid Systems.

For further information on TURCAM including full labeling and recommendations for use please contact your local distributor or write to the address below.



TURCAM®

Broad Spectrum Insecticide

™

BFC Chemicals, Inc.
4311 Lancaster Pike
Wilmington, DE 19805

Anniversary *from page 20*

potential, prospective varieties are quite often discarded because their performance shows no significant improvement over present varieties.

Jacklin currently produces or markets 41 Kentucky bluegrass varieties, 10 perennial ryegrasses, five bentgrasses, plus a number of fescues and seeds for environmental and reclamation use. Some of the company's most recent variety additions include Fylking, known as one of the outstanding varieties for cool season bluegrass regions; and Glade, which was developed to thrive in shade and full sun. Other recent additions include Cheri, Eclipse, Ram I, Wabash, Birka and Bayside.

As another part of its research program, Jacklin provides other companies contract testing, genetic purification, and propagation of new seed varieties which have been, or will soon be released. Contract grown seed is cleaned and readied for merchandising under each company's brand name.

Equally significiant are Jacklin's contributions to seed production technology. Row cropping to produce foundation seed had been done before, but Jacklin applied it to the production of certified seed. The original technology was using a stripper on natural stands in the Midwest. In the Northwest this technology was altered to solid seeded stands of grasses which were cut and dried on large concrete drying slabs. In row cropping certified seed, Arden Jacklin used a swather to put the cut grass in windrows for drying in the field and used a combine to pick up and separate the dried seed from the stems. This technology cut losses of seed during drying and reduced seed handling to a minimum.

In 1972, Jacklin merged with Vaughan's Seed Co. to form The Vaughan-Jacklin Corp. Vaughan is a horticultural wholesaler of gardening equipment, seeds and plants. The Jacklin Seed division maintains its original integrity under the merger agreement. After 43 years in its Dishman headquarters, Jacklin moved its operation to new facilities in Post Falls, ID, in 1978. In April 1981, Jacklin purchased the Nezperce, ID, operating facilities of Gold Coast Seed Co. In addition to the facilities, this added growers who devote approximately 4000 acres to production of lawn seed.

Two months later, Jacklin acquired certain assets of Jenks-White Seed Co., Tangent, OR. In 1980, Jenks-White reported $6 million in seed sales. Jacklin currently farms over 5000 acres and combines with 23,000 grower acres in Idaho, Washington, Oregon and Montana.

For the past several years, three sons of Arden Jacklin have been managing the Jacklin division. Duane Jacklin is general manager, Doyle Jacklin, marketing manager, and Don Jacklin, production manager. Arden continues to be semi-active as supervisor of the extensive research activities for a wide varieties of grasses.

Vermeer Manufacturing Co. owes its start to a young farmer with the inventiveness to design a mechanical wagon hoist to speed up his farming operation and eliminated some of his work. The interest and demand for that product led Gary Vermeer to build a 2400-square foot factory in 1948. While the company has not manufactured a single hoist in the last 30 years, it has invented, produced and marketed over 50 different products throughout the world to a wide variety of customers. Today, Vermeer occupies more than 738,000 sq. ft. of production space and employs nearly 1000 people.

As Vermeer expanded over the years from a one-product company to a multi-faceted manufacturer, many of its innovations came in the area of trenching. Today the company boasts the most complete line of quality trenching machines. Models range from track to tire-driven, 18 to 195 hp and a selection of attachments that includes: vibratory plows, industrial loaders, backhoes, backfill blades, boring tools, rock cutters, rotary brooms, hammers, and reel carriers. With its eye towards the future, Vermeer continues to engineer new cutter designs, plow designs and precision grade controls.

Another segment of the company's Industrial division is devoted to tree equipment. (Trenchers are also part of the Industrial division.) This year marks the 25th anniversary of one of Vermeer's star products—its patented stump cutter. The company markets seven hydraulically-controlled stump cutters and lays claim that it markets more stump cutters than all other competive models combined.

In the late 1960's Vermeer introduced its tree spade. Designed to dig, transport and transplant large trees and shrubs, these units are available in five basic sizes as trailer, tractor or truck-mounted models. More recently the company has marketed its log chipper, log splitters and brush chipper with success.

While the Industrial division is comprised of tree and trencher equipment, the Agricultural/Irrigation divisions market numerous farm-related products. Long a well-respected name in the farm market, the last 20 years have been a period of unprecedented growth for Vermeer's Ag/Irrigation divisions. Two of the products that were responsible for this growth were the company's Traveling Sprinkler system and the Vermeer Baler. Today Vermeer has 900 farmer dealers who sell and service these and other farm units nationwide. **WTT**

Nursery Marketing Council

We support NMC and ask our growers and suppliers to include the voluntary contribution on invoices to us.

OUR NEW 62. WE PICKED ITS ENGINE APART.

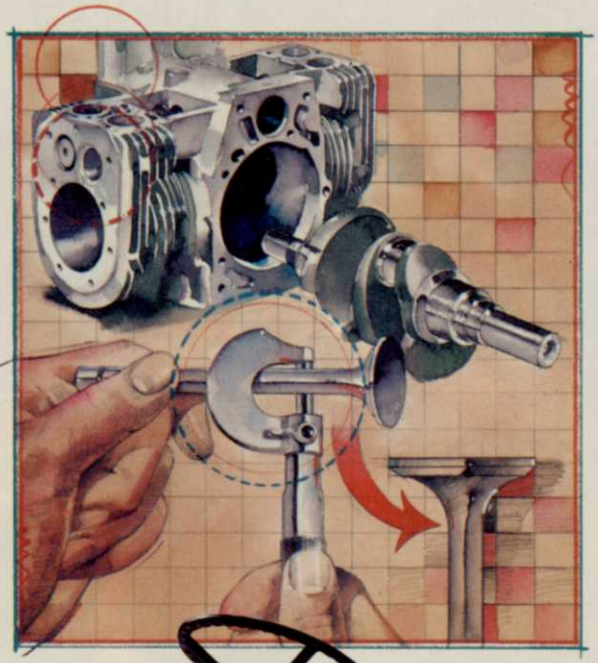
BECAUSE WE'RE PICKY ABOUT POWER.

When Toro introduces a new riding rotary mower, you can be sure it's engineered to keep you cutting.

Because, for one thing, we never forget that engineering begins with *engine*. Picking exactly the right power to match width of cut and kinds of attachments.

Too much power wastes fuel and is inefficient. Too little power stunts productivity and works the engine to death.

So we've powered our new Toro Groundsmaster® 62 with an Onan 20 hp, twin cylinder engine. But only after considering 10 excellent candidates, narrowing them down to 3 for testing, then literally picking apart our final choice.



We tested it on a dynamometer to verify its power rating. We tore it down and inspected it part by part for durability. We tested it for noise. We tested it for vibration. We tested it for fuel economy. Then, we ran it hard for 1,000 hours to make sure it was up to going to work for our new 62. And you.

And, to keep you cutting, we evaluated its serviceability, too. Made sure its routine maintenance points and replaceable oil filter are easy to get to.

Call your Toro distributor. He'll tell you more about our new Groundsmaster 62. The high capacity 62" professional now teamed with our Groundsmaster 52 and gas and diesel Groundsmaster 72s to offer you a complete line of riding rotaries.

TORO®

THE PROFESSIONALS THAT KEEP YOU CUTTING.

"Toro" is a registered trademark of The Toro Company, 8111 Lyndale Ave. So., Minneapolis, Minnesota 55420.

SWITCH HITTER

Shade or sun, Glade's a beauty that grows both ways. When trees and structures throw shadows on your plans, it's time to call in Glade to swing with the hot times and up to 60% shade. Excellent dark green color, fine texture and better disease resistance make Glade a big hit with crowds in recreation areas, or simply covering home and commercial grounds. Switch to Glade for consistently high scores in sun or shade. At your local wholesale seed distributor.

Glade KENTUCKY BLUEGRASS

U.S. Plant Patent 3151
License in Canada No. 2133

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Another fine quality-controlled product of Jacklin Seed Company

WT&T

Landscape Weed Control Guide

This annual project is a collection of information from more than 20 weed scientists in the United States. Each year the content will build, be updated, and get more specific. The purpose is to gather the most current data on herbicide use and application for the user.

Reader input to this annual project is welcome. Comments or experiences from readers will also be included in the Guide the following year. Write to Weeds Trees & Turf magazine, 757 Third Ave., New York, NY 10017.

Illustrations were provided by the New York State Turfgrass Association from an audio/visual series developed by Dr. Arthur Bing. The slide set and script to the program are available from NYSTA, 210 Cartwright Blvd., Massapequa Park, NY 11762.

Buy a mowing tractor and get a compact utility tractor in the bargain.

There's hardly a mowing job you can think of that a John Deere 650 or 750 can't stand up to.

There's also hardly any other job you can think of that one of them will back away from.

So they can promise you maximum productivity and flexibility. And deliver it for years to come.

Because, besides a choice of three mowers—center or hitchmounted for grooming, and rotary for rougher cutting—you get an almost endless choice of capacity-matched attachments: front loaders, tiller, disk, box scrapers, front and rear blades, even a posthole digger and a post driver.

Now, having that kind of choice is important. And so is knowing that all these are designed to attach quickly, without ever having to fabricate a fit or hope that someone else's attachment will work.

But most important of all are the tractors all those attachments attach to: John Deere 650 and 750 Task-Master™ Diesel Tractors.

They're high-clearance 14.5- and 18-PTO-hp tractors powered by fuel-stingy, long-lived diesel engines. On either model, standard features include 8 forward and 2 reverse speeds, 540-rpm rear power takeoff, differential lock, and a Category 1 3-point hitch. Plus options that include mechanical front-wheel drive, and traction-tread or high-flotation tires.

All features you expect to find only on much larger tractors.

And maybe best of all, they're priced right. Plus your John Deere dealer has a service and parts organization that understands what downtime can do to an owner who depends on his tractor for a living.

The John Deere 650 and 750 Compact Utility Tractors.

The tractors that give you big mowing capacity in a small size. And then go on to give you more.

Nothing Runs Like a Deere®

For nearest dealer or for free folder, call 800-447-9126 toll free (Illinois 800-322-6796) or write John Deere, Dept. 67, Moline, IL 61265.

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*Maximum PTO hp measured at 2600 engine rpm for the 650, 2400 engine rpm for the 750, factory observed.

WT&T Landscape Weed Control Guide

First the drought, and now a tight economy, have forced some compromises in weed control programs. The exercise of working within restrictions has been a constructive one showing us alternatives we never sought to find.

The result is a landscape manager who thinks for himself in adjusting herbicide programs to fit local conditions. To accomplish this he needs to know more about herbicidal characteristics, target weeds, and environmental factors that effect control results.

The weed control product manufacturer has also responded to local needs with state labels for more herbicides and products designed to place herbicides where they are most effective. Expanded labels for existing herbicides have proven very useful to the landscape industry.

Changes are taking place which go beyond short term solutions to drought and economic conditions. Native vegetation is being planted where management of higher maintenance vegetation proved costly and time consuming. Native shrubs, wildflowers, and native grasses have allowed landscape managers the time and resources to concentrate on areas requiring regular maintenance.

Vegetation does not have to be native to perform aggressively in a particular region. Renovation of turf areas to more vigorous cultivars may solve a recurring weed encroachment problem. Weeds generally get a foothold by seeding or vegetative spreading while desired grasses are dormant or thinned by mismanagement.

Landscape managers in the transition zone, and even the southern cool season region are switching to improved tall fescues and zoysiagrass to maintain hardiness in the summer heat. Southern landscape managers find overseeding and herbicide applications during winter dormancy help to protect desired species from weed encroachment. Advances in seed production and viability for zoysiagrass and centipedegrass may make renovation to these species more practical.

These are not the only alternatives by any means. Attention to mowing height, irrigation, soil pH, drainage, and compaction can assure the best defense against weeds, a dense, healthy turf. Other factors to consider are air circulation, shade conditions, and slope.

Some locations are simply too harsh for turfgrass to succeed and should be converted to a more realistic form of vegetation or the site altered to fit the needs of the turfgrass. Maintaining a good turf cover under trees and shrubs is often impractical. Parking islands in asphalt lots are generally too harsh for turfgrass survival and impractical for maintenance. Alternate landscape plans are needed for such areas.

One of the biggest maintenance headaches is weed control in ornamental displays. Shrubs, flowers, and groundcovers require much more maintenance than turf. Advances in preemergence and longer residual selective herbicides for container and bedding ornamentals provide some maintenance efficiency for these important landscape elements.

Nonselective weed control around fences, structures and plants has not changed appreciably except for the rapid, systemic properties of glyphosate (Roundup, Kleenup). The loss of silvex has caused some adjustment in clearance weed control.

Weeds

The problem weed(s) must be identified before effective control can be implemented. Many factors are based upon the specific target weed(s). These include application timing, chemical used, type of control which is most effective (pre- or postemergence), and application method.

The desirable plants must also be identified to avoid damage. For example, use of some preemergence herbicides for turf on fine fescue of bermudagrass may cause noticeable damage and defeat the purpose of weed control from health and appearance standpoints.

In this Guide, we will focus on the primary target weeds and the products that most effectively control them. Usually there are a number of weeds requiring control at one time and herbicides can be combined, such as broadleaf and grassy weeds in turf. There are very few one solution cures to standard weed control problems. Thought and planning are necessary. The primary distinction between weeds for control purposes is whether they are grasses (monocots) or broadleaf weeds (dicots). Herbicides designed for use against grassy weeds will be ineffective on broadleaf weeds. Furthermore, there is a separate set of herbicides for preemergence treatments and postemergence treatments.

Grasses

Bentgrass - A desirable grass in certain locations, creeping bentgrass can encroach on cool season turf consisting of Kentucky bluegrass, perennial ryegrass, and fine fescue. Bentgrass has extremely small seed and is a major target of seed producers during cleaning to provide seed buyers with certified seed. It is extremely difficult to selectively treat lawns to remove bentgrass.

Bermudagrass - Like bentgrass, bermudagrass encroaches on other desired grasses, but mainly in the South. This extremely hardy grass can outperform other warm season turfgrasses, even where it is not wanted. Bermudagrass is sensitive to a number of preemergence herbicides.

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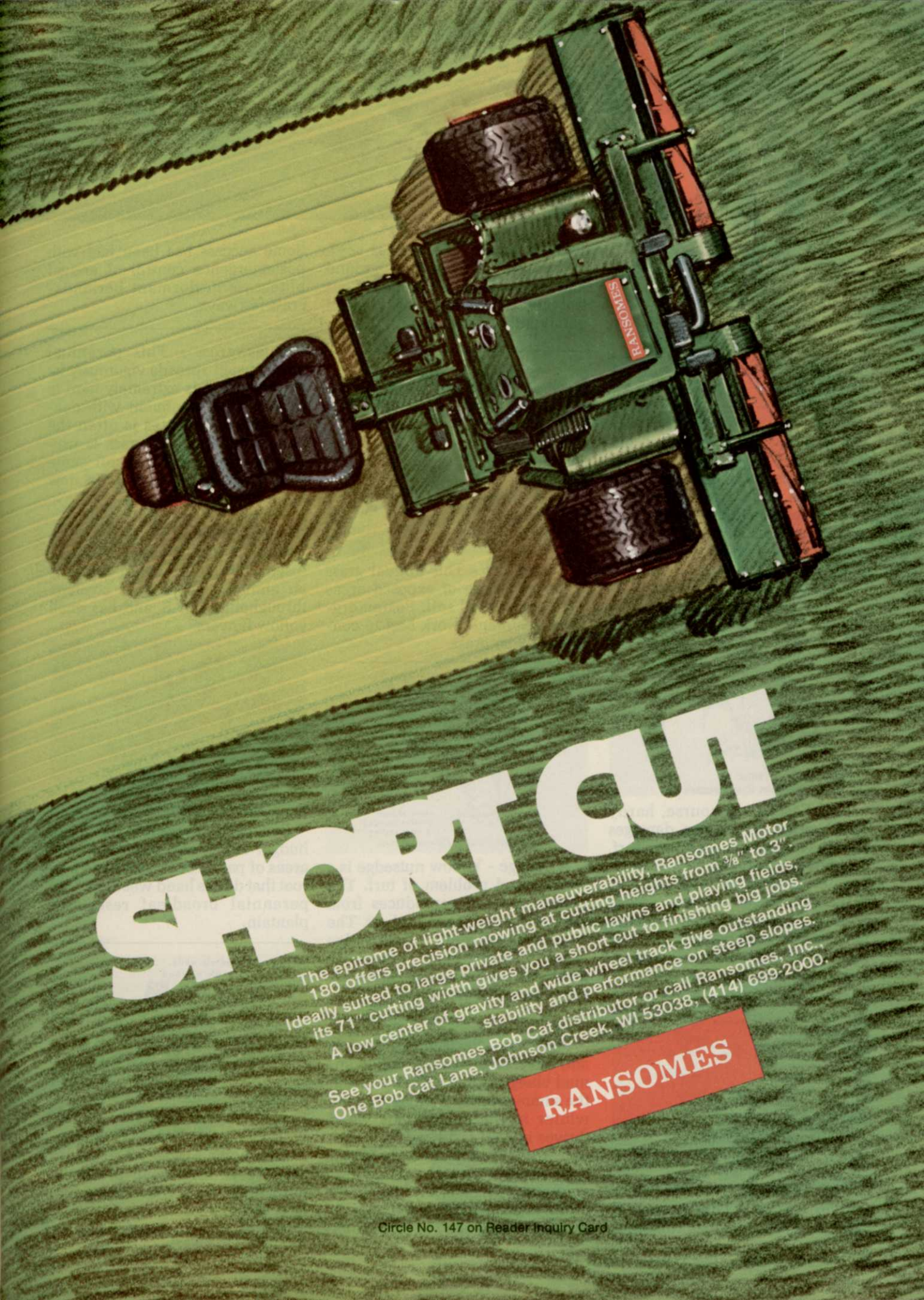

SHORT CUT

The epitome of light-weight maneuverability, Ransomes Motor 180 offers precision mowing at cutting heights from 3/8" to 3". Ideally suited to large private and public lawns and playing fields, its 71" cutting width gives you a short cut to finishing big jobs. A low center of gravity and wide wheel track give outstanding stability and performance on steep slopes.

See your Ransomes Bob Cat distributor or call Ransomes, Inc., One Bob Cat Lane, Johnson Creek, WI 53038, (414) 699-2000.

RANSOMES

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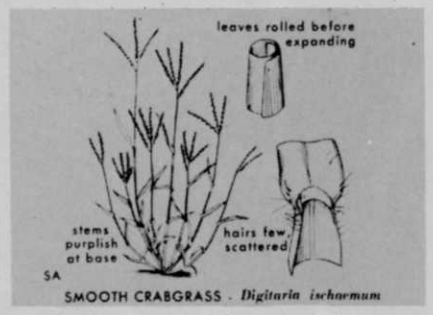
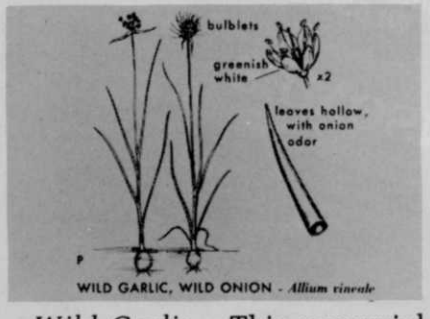
WT&T Landscape Weed Control Guide

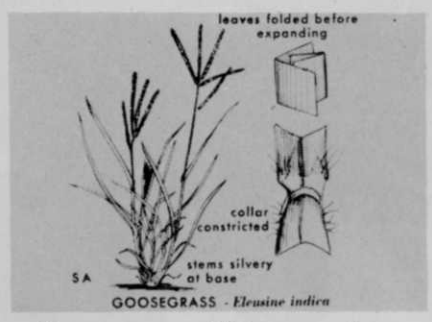


Crabgrass - The number one spoiler of turf in many areas, crabgrass is an annual spreading grass. As a result, a great deal of research has gone into its control with much success. A properly timed preemergence program can effectively control crabgrass.

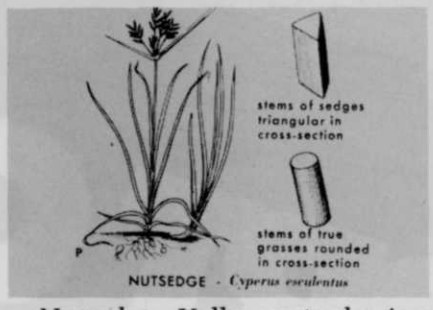
Tall Fescue - A course, hardy bunch grass, tall fescue damages the appearance of cool season turf. Tall fescue's drought tolerance and low fertilization requirement give it the advantage over cool season grasses. These same characteristics have led to selection of fine leaf types of tall fescue for low maintenance and transition zone turf.



Wild Garlic - This perennial monocot, not a grass, has numerous ways to spread. It produces seed, and can spread from above-ground and below-ground bulblets. Control must kill the bulbs and prevent germination of the seed.



Goosegrass - This annual grass takes advantage of exposed areas with compacted soil. Postemergence treatments work best to control this wiry grass.


stems of sedges triangular in cross-section
stems of true grasses rounded in cross-section
P
NUTSEDGE - Cyperus esculentus

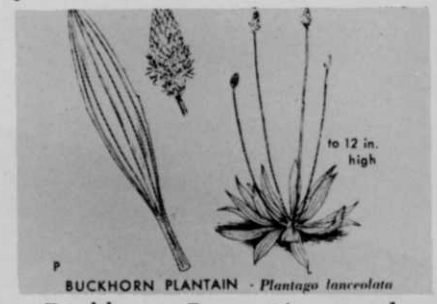
Nutsedge - Yellow nutsedge is a major weed problem of turf. The perennial weed reproduces from seed and underground tubers. The yellow appearance of nutsedge makes it stand out in otherwise green turf. Systemic herbicides are required to kill the tubers.

Poa annua - Persistent seedheads and blotches of summer-killed annual bluegrass make this a weed in the summer in the north and in the winter in the south. This weed thrives in well fertilized, irrigated, and low cut turf. Its light green color and white seedheads are easily spotted. Much effort is spent on trying to control this weed, mainly in preemergence applications. Some success has been had with postemergence control of annual bluegrass in dormant bermudagrass fairways.

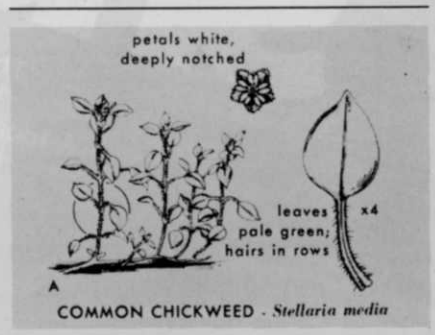
Quackgrass - This perennial grassy weed spreads vigorously by rhizomes and is extremely hard to control. Spot treatment with nonselective herbicides is often the only solution. Quackgrass is usually present when topsoil came from rural areas, such as in new home lawns.

Broadleaf Weeds

Black Medic - Occasionally confused with clover, black medic is an annual legume. It is common throughout the U.S. and has small yellow flowers.



Buckhorn - Present in many low budget lawns and mow-only turf areas of parks, buckhorn has a taproot that defies hand weeding. This perennial broadleaf resembles plantain.



Common Chickweed - This annual spreading weed of shady, moist areas has a white flower and light green foliage.

Continues on page 34

PROGRAM: TURF

SUBJECT: Weed control

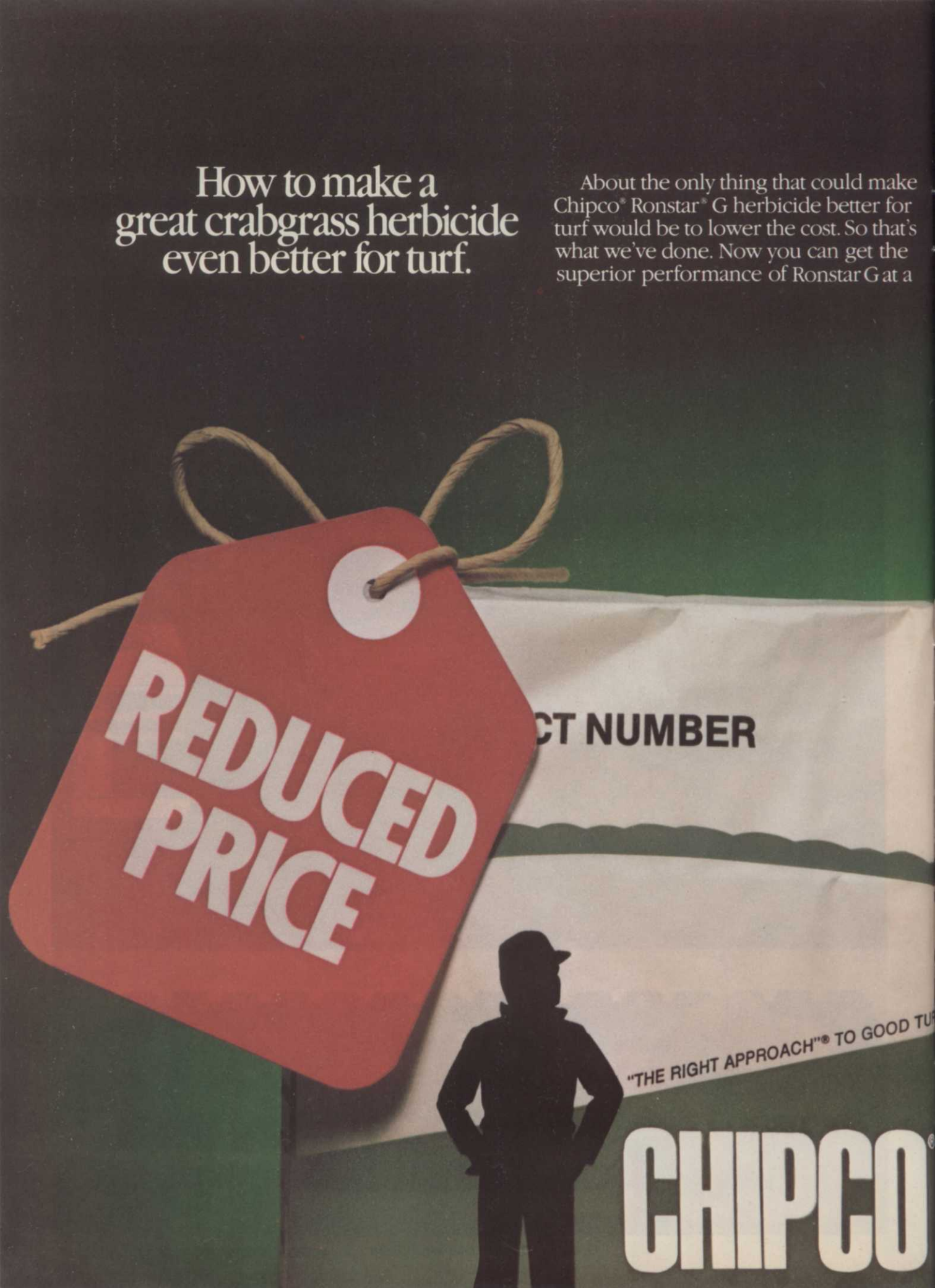
PROBLEM:
—Control of yellow nutsedge.
—Most consistent performance.
—Exceptional turf tolerance.

SOLUTION:
For this problem, the solution is clear. Basagran® herbicide. Because for consistent yellow nutsedge control and exceptional turf tolerance, Basagran is clearly the best. Read and follow label directions. *BASF Wyandotte Corporation, Agricultural Chemicals Group, 100 Cherry Hill Road, Parsippany, NJ 07054.*

When you define the problem, the solution is clear.

How to make a great crabgrass herbicide even better for turf.

About the only thing that could make Chipco® Ronstar® G herbicide better for turf would be to lower the cost. So that's what we've done. Now you can get the superior performance of Ronstar G at a



dramatically reduced price.

Nothing controls crabgrass and goose grass better than Ronstar G. And you get this great weed control for the whole season with just one easy, early application.

Treat your turf with Ronstar G. The great crabgrass herbicide with the better-than-ever price. Rhône-Poulenc Chemical Co. Agrochemical Div., Rhône-Poulenc, Inc. Monmouth Junction, NJ 08852.

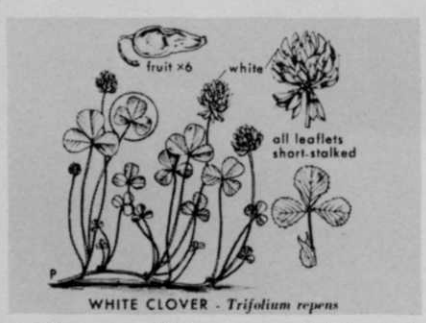
RONSTAR® G HERBICIDE

Circle No. 149 on Reader Inquiry Card

WT&T Landscape Weed Control Guide

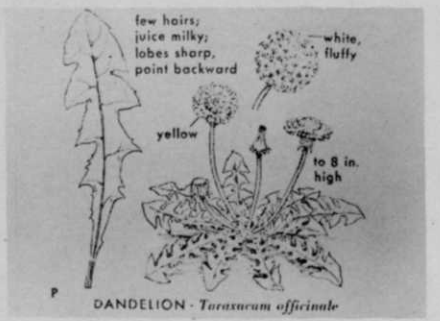
MOUSE-EAR CHICKWEED - *Cerastium vulgatum*

Mouse-Ear Chickweed - The perennial version of chickweed, prefers open sun and also has white flowers.



WHITE CLOVER - *Trifolium repens*

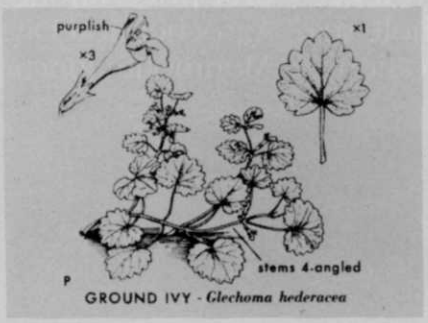
Clover - This perennial broadleaf embarasses turf managers with large pink flowers in the spring and tan patches of dead foliage in the summer.



DANDELION - *Taraxacum officinale*

Dandelion - This perennial, famous for its taproot and yellow flower, is a dead give-a-way to neighbors with poor lawn maintenance. All children flock to lawns with the puffy seedheads in late spring.

Ground Ivy - This perennial can dominate in poor, shady soil. A member of the mint family, this aggressive spreader hugs the ground and produces a purple flower.

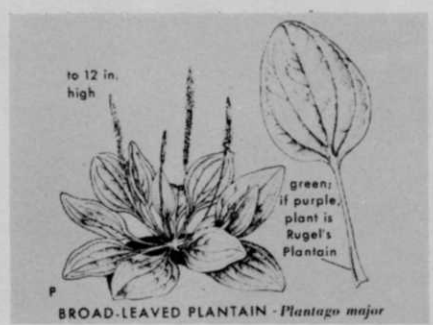


GROUND IVY - *Glechoma hederacea*

Henbit - Taller than ground ivy, despite purple flowers and scallop-shaped leaves, henbit is a winter annual most noticeable in early spring.

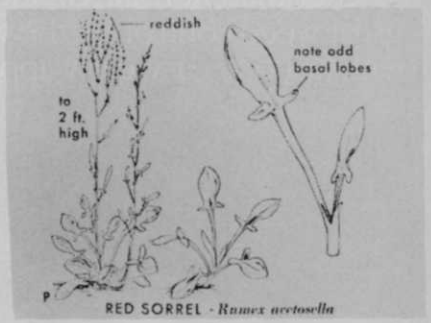
HEAL-ALL - *Prunella vulgaris*

Heal-All - This hairy-leafed perennial is common in new and poorly maintained lawns throughout the U.S. It can spread beneath the level of mower blades.



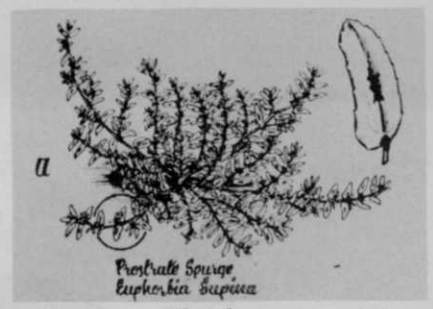
BROAD-LEAVED PLANTAIN - *Plantago major*

Plaintain, Broadleaf - Hosta-like leaves of this perennial surround tall purple stalks containing seeds. The leaves, unlike hosta, lay flat on the surface of the soil.



RED SORREL - *Rumex acetosella*

Red Sorrel - This tenacious perennial has arrow-shaped leaves and spreads by roots and rhizomes. It can quickly overtake desirable turf weakened by acid soil.



Spurge - The leaves contain a spot in the center of the upper surface. The seed of this heavy seed producer germinates in the early spring. The spreading branches of this annual when broken contain a milky substance.

Sow Thistle - This annual has flowers similar to dandelion but its leaves have spines on the edges and deeper indentations.

Lambsquarter - A summer annual of large size if not mowed, lambsquarter foliage is light green.

Turf Herbicides

Once a weed is identified as grassy or broadleaf, and possibly winter or summer annual, control methods are narrowed down. Different sets of chemicals are used for preemergence or postemergence control of each type. Location of the weed also determines the chemical used.

Continues on page 36

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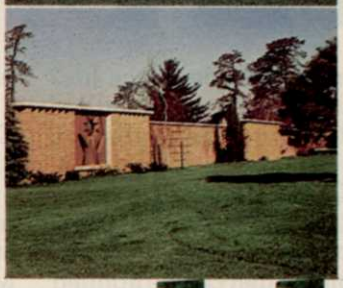

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*U.S. Plant Pat. No. 3150

The primary preemergence herbicides for grassy and broadleaf weeds in turf are benefin (Balan), bensulide (Betasan, Betamec-4, Pre-San), DCPA (Dacthal), oxadiazon (Ronstar), and siduron (Tupersan). Siduron is the only preemergence herbicide that can be applied near time of seeding. Bensulide and DCPA can be applied in the spring following a fall seeding. Benefin and oxadiazon should be applied to established turf. Bensulide can affect rooting of existing bermudagrass, and caution is advised for use of most preemergence herbicides on bermudagrass greens.

Thinning of fine fescue turf and stands of overseeded cool-season grasses in the South have been reported. A list of grasses safe for preemergence application follows.

Benefin	Kentucky bluegrass perennial ryegrass fescue bahiagrass bermudagrass centipedegrass St. Augustine zoysia
Bensulide	perennial bluegrass perennial ryegrass fescue bentgrass bermudagrass bahiagrass centipedegrass St. Augustine zoysia
DCPA	well-established lawn grasses caution for some bentgrasses
Oxadiazon	perennial bluegrass perennial ryegrass bermudagrass St. Augustine
Siduron	perennial bluegrass fescue perennial ryegrass certain bentgrasses zoysia

Preemergence herbicides should be watered in to get the chemical to the seed prior to germination and should remain effective for six to eight weeks.

Timing of application is critical. Check with local extension for precise dates for application.

The primary postemergence herbicides for grassy weeds in turf are the arsonates; CMA, DSMA, MAMA and MSMA. These chemicals have no residual toxicity so more than one application is required for good control. Treated areas can be seeded after two weeks.

Arsonates should not be used on centipedegrass, St. Augustine, or carpetgrass. Bentgrass and fescue are more sensitive to the arsonates than other grasses. CMA is the safest for use on bentgrass.

Weed foliage should be sprayed while still young (2 to 3 leaf stage). Any discoloration of desired turfgrasses may be remedied by irrigation. Effectiveness of the arsonates improves with temperature and rates may need to be increased for temperatures under 80 degrees F.

The primary postemergence herbicides for broadleaf weeds are 2,4-D, dicamba (Banvel), and MCPP. The herbicides should not be applied until a new lawn has had at least three mowings. The target weeds should be actively growing for best results. The temperature should be at least 60 degrees F. Applications during extreme heat or drought can severely damage desirable turf.

Again, consult your local extension agent for precise application timing. At least two treatments are generally necessary. Wait four weeks between treatments. Winter annuals can be sprayed early in the year, followed by summer annuals and perennials. Fall treatment for perennials is possible. When consulting the extension agent, take samples of the target weeds for identification and timing advice.

Often postemergence broadleaf herbicides are combined. Trimec and Trex-san are combinations of all three. Weed-B-Gon is 2,4-D and MCPP. Super-D Weedone and Banvel + 2,4-D are dicamba, 2,4-D combinations.

Specialty Herbicides

Weeds in turf that seem to defy standard treatments, such as *Poa annua*, nutsedge, and goosegrass, require extra effort and specialty herbicides in some situations.

Poa annua is the most prevalent weed on golf courses in the U.S. In cool, moist climates it will dominate fairways if uncontrolled. This prolific seed producer also invades overseeded turf in the South.

Benefin, bensulide, and DCPA are used preemergence against *Poa*, but fall treatment with preemergence also disrupts seeding of desirable grasses. Glyphosate and metribuzin (Sencor 50W) have been used to stop annual bluegrass in dormant bermudagrass. Pronamide (Kerb) and Endothal have provided postemergence control of *Poa annua* in bermudagrass. These treatments for *Poa annua* are also effective against chickweed, henbit, and other broadleaf weeds.

Nutsedge can be controlled with 2,4-D and the arsonates. However, a special label was granted for control of yellow nutsedge with bentazon (Basagran) in established turf.

Goosegrass and crabgrass control in bermudagrass has been helped with a state local need labels for metribuzin (Sencor 50W). Tests at North Carolina State have shown metribuzin as a postemergent controls *Poa annua*, chickweed, and henbit. Some bermudagrasses are partly sensitive to metribuzin. Preemergence treatments of oxadiazon are effective against goosegrass.

Preplant Control

Since many weed headaches are caused by weed seed present in the soil at planting, soil fumigation can prevent problems later. Insects and fungi are controlled at the same

Continues on page 40

Either way, Balan® is your budget's best friend.

For years, Balan® has been one of America's most popular preemergence herbicides. It's earned its popularity by giving dependable control of turfgrass troublemakers like crabgrass, goosegrass, poa annua, and foxtail.

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The Cushman Front Line doesn't go out of service when the mowing season is over. It can work for you all year 'round when you add accessories like the ROPS structure and weathertite cab, 60″ rotary broom (gas unit only) and the 48″ snow thrower.

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time.

Methyl bromide (Dowfume), metham (Vapam), dazomet (Mylone) and Vorlex are used for preplant fumigation. Residues can delay seeding up to three weeks or more. Fumigants are applied to loose soil. Lately, glyphosate (Roundup) has provided a faster alternative to fumigants, however, it controls only living plants, not seeds, fungi, or insects. Other nonselective herbicides for grasses are amitrole, cacodylic acid (Phytar), and dalapon. Glyphosate and cacodylic acid are deactivated within seven days, whereas amitrole and dalapon can remain active for four to six weeks.

Ornamental Weed Control

The emphasis on weed control in landscape displays is more on preplant and accurate application of nonselective herbicides than selective herbicides.

Some of the preplant and preemergence herbicides can effect bulbs so be sure to read labels carefully for restrictions and uses. In addition to bensulide, DCPA, and oxadiazon, are many other preemergence and preplant products not used for turf. They include chloramben, chlorpropham (Furloe), dichlobenil (Casoran), diphenamid (Dymid, Enide), EPTC (Eptam), oryzalin (Surflan), pronamide (Kerb), trifluralin (Treflan), and simizine (Princep). For certain landscapes, you may want to fimigate prepared soil three weeks prior to planting with metham (Vapam), methyl bromide (Dowfume), dazomet (Mico-Fume), or Vorlex. Extra caution is required with use of fumigants. Both fumigants and preemergence and preplant materials must be soaked in or mixed with the soil for control. Glyphosate (Roundup) and paraquat can be applied prior to planting on a nonselective basis. These same herbicides can be used with rope wick applicators for postemergence control of weeds. Since it has little or no residual toxicity, paraquat can be mixed with other herbicides (simazine, oryzalin) for extended control.

The primary postemergent herbicides for ornamentals are Devrinol (fall application best), diphenamid (Enide), oryzalin (Surflan), oxadiazon (Ronstar), simazine (Princep), and trifluralin (Treflan). These herbicides should only be applied under no or very low wind conditions, granular products should not be applied over wet foliage, and all products should be watered in. Few landscape planting contain one type of plant and each plant should be judged for sensitivity to a number of herbicides. Postemergent herbicide toxicity changes with temperature as well.

Brush Control

The list of herbicides for brush control is much longer than for turf or ornamental weed control. The main concern is control of spray

Continues on page 42

Herbicides and Manufacturers

Chemical	Brand Name	Company	Chemical	Brand Name	Company
amitrole	Amitrol-T	Union Carbide	Ethofumesate	Nortron	BFC
asulam	Asulox	Phone Poulenc	fenac	Fenatrol	Union Carbide
atrazine	Atratol	Ciba Geigy	fosamine	Krenite	Du Pont
benefin	Balan	Elanco	glyphosate	kleenup	Ortho
bensulide	Betamec	P.B.I. Gordon		Roundup	Monsanto
	Betasan	Stauffer	linuron	Lorox	Du Pont
	Pre-San	Mallinckrodt	methyl bromide	Dowfume	Dow
bentazon	Basagran	BASF	metham	Vapam	Stauffer
bromacil	Hyvar	Du Pont	metribuzin	Sencor	MoBay
bromoxynil	Brominal	Union Carbide	monuron	Urox	Hopkins
cacodylic acid	Phytar	Crystal	MCPP	Mecomec	PBI Gordon
chloramben	Amiben	Union Carbide		Chipco Turf Herbicide	Rhone Poulenc
chlorpropham	Furloe	PPG		MCPP	Cleary
dalapon	Dalapon	Diamond Shamrock		Weedhoe	Vineland
dazomet	Mylone	Hopkins	MSMA	Surflan	Elanco
DCPA	Dacthal	Diamond Shamrock	oryzalin	Ronstar	Rhone Poulenc
dinoseb	Premerge 3	Dow	oxadiazon		Ortho
	Dynamyte	Drexel	paraquat	Tordon	Dow
Devrinol		Stauffer	picloram	Pramitol	Ciba Geigy
dicamba	Banvel	Velsicol	prometon	Kerb	Rohm & Haas
dichlobenil	Casoron	Thompson Hayward	pronamide	Tupersan	Du Pont
diphenamid	Enide	Tuco/Upjohn	siduron	Princep	Ciba Geigy
DSMA		Crystal	simazine	Spike	Elanco
dinitrophenol	Dinitro	Thompson Hayward	tebuthiuron	Treflan	Elanco
diuron	Karmex	Du Pont	trifluralin	Garlon	Dow
diquat	Ortho Diquat	Ortho	triclopyr		Nor-Am
endothall	Endothall	Pennwalt	Vorlex		
EPTC	Eptam	Stauffer			

Combinations

Amizine	amitrol and simazine	Union Carbide
Banvel plus	dicamba and 2,4-D	Velsicol
	dicamba and 2,4-D, dalapon	Velsicol
Broadside	MSMA and cacodylic acid	Crystal
Chlorea	diuron, sodium chlorate, sodium metaborate	Rhone Poulenc
Fenamine	amitrole, fenac, atrazine	Union Carbide
Hopkins Rout G-8	bromacil and diuron	Hopkins
Krovar	bromacil and diuron	Du Pont
MonDak	MSMA and dicamba	Velsicol
Pramitol 5PS	prometon, simazine, chlorate	Ciba Geigy
Tordon	picloram and ammonium sulfate	Dow
Trimec	2,4-D, MCPP, and dicamba	PBI Gordon
Urox	monuron and TCA	Hopkins
Vegemec	prometon and 2,4-D	PBI Gordon
Weedmaster	dicamba and 2,4-D	Velsicol
Weedone	dichlorprop and 2,4-D	Union Carbide

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AVOID ACCIDENTS: For safety, read the entire label including precautionary statements. Use all chemicals only as directed.

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drift. Combinations offer the best control is most cases. Products sold in combination formulations simplify handling and mixing since compatibility problems have been solved in manufacturing (such as Trimec where the formulation process eliminates the tendency for 2,4-D or MCPP to crystallize out of solution). Manufacturers add surfactants to some products to improve product performance and adherance. Some of these combinations are Amizine (amitrole and

Continues on page 44

Summary of herbicide treatments on control of weeds in turfgrasses in Georgia. (B.J. Johnson)

Treatments		Weed species[a]								
Herbicide	Rate	Crab-grass	Goose-grass	Henbit	Common chick-weed	Spur-weed	Parsley-piert	Hop clover	Corn speedwell	Annual bluegrass
	lb/A									
Atrazine	2.0			Po	Po	Po	Po	Po	Po	Po
Bensulide	10.0	P					P			P
Benefin	3.0	P		P	P				P	P
DCPA	10.0	P			P				P	
DSMA	3.0	Po								
Ethofumesate										P, Po[c]
Glyphosate[b]	0.5			Po	Po	Po	Po	Po	Po	Po
Metribuzin	0.5		Po	Po	Po	Po	Po	Po	Po	Po
Metribuzin + MSMA	0.12+									
	2.0	Po	Po							
MSMA	2.0	Po								
Oxadiazon	3.0	P	P				P	P	P	P
Paraquat[b]	0.5			Po	Po	Po	Po	Po	Po	Po
Pronamide	0.75				P				P, Po	P, Po
2,4-D[d]	1.0			Po	Po	Po	Po	Po	Po	
2,4-D+dicamba[d]	1.0+									
	0.5			Po	Po	Po	Po	Po	Po	
2,4-D+mecoprop + dicamba[d]	1.0+									
	0.5+									
	0.1			Po	Po	Po	Po	Po	Po	

[a] Weeds controlled from preemergence treatments are represented with P and those with postemergence treatments are represented with Po.

[b] Turfgrass must be completely dormant when paraquat and glyphosate are used. Paraquat has restricted use and applicator must be certified. Glyphosate does not have specific label for turf except for renovation.

[c] Safe to apply to bermudagrass overseeded with ryegrass.

[d] Repeated treatments at 2-week interval may be needed for effective control.

Lawn grass tolerance to herbicides in Georgia. (B.J. Johnson, Univ. of Georgia)

	Herbicides								
Turfgrasses	Benefin	DCPA	Bensulide	Oxadiazon	Atrazine	DSMA MSMA	2,4-D[1]	Paraquat	Glyphosate
Bermuda	T	T	T	T	S*	T	T	S*	S*
Zoysia	T	T	T	T	S*	S-I	T	S	S
Centipede	T	T	T	T	T	S	S*	S	S
St. Augustine	T	T	T		T	S	S	S	S
Tall fescue	T	T	T	T	S	T	T	S	S
Bahia	T	T	T		S-I	S-I	T	S	S

T = Tolerance; safe to use herbicide at recommended rates.
S = Sensitive; Do not use this herbicide.
S-I = Intermediately tolerant; use herbicide with care since grass may be injured.

*Tolerant to herbicides when turfgrass is dormant.

[1] Includes mecoprop and/or dicamba.

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simazine), various Banvel combinations (dicamba plus), Broadside (MSMA and cacodylic acid), Chlorea (sod, sodium chlorate, diuron), Dowpon (dalapon and sodium TCA), Fenamine (amitrole, fenac, atrazine), Hopkins Rout G-8 (bromacil and diuron), Krovar (bromacil and diuron), MonDak (MSMA and dicamba), Pramitol 5PS (prometon, simazine, chlorate), Tordon (picloram and 2,4-D), Urox (monuron and TCA), Vegemec (prometon and 2,4-D), Weedmaster (dicamba and 2,4-D), and Weedone (2,4-D and dichlorprop). See list for separate brush control herbicides.

Equipment and Methods

The greatest advances in equipment and methods have come from nurserymen and lawn care companies. These were adapted mainly from agriculture, such as the rope wick applicator and irrigation injection. One specialized technique currently being tried by ChemLawn is a holster-mounted canister of specialty herbicide which can be injected into the spray hose at the site by the applicator. When needed for a special situation, the applicator can easily inject a proportioned amount of chemical into the flow of the spray at the gun.

The need or usefulness of chemicals has not diminished. Integrated pest management programs have not eliminated the need for landscape pesticides. If anything, it has improved the use of chemicals and put decision-making more in the hands of the applicator instead of the manufacturer. The safety of chemicals has been enhanced by this, especially for restricted use products applied by certified applicators. Chemicals, such as the phenoxys, are safer than ever in the hands of trained personnel.

Brush Control Herbicides

amitrole	diuron (Karmex)
asulam (Asulox)	fenac
atrazine	fosamine (Krenite)
bromacil (Hyvar)	linuron (Lorox)
bromoxynil	MSMA (Ansar)
cacodylic acid	monuron (Urox)
dalapon (Dowpon)	picloram (Tordon)
dicamba (Banvel)	prometon (Pramitol)
dichlorprop	tebuthiuron (Spike)
dinitrophenol	triclopyr (Garlon)
dinoseb	2,4-D

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USGA SPECIFICATIONS

PROPER GREEN CONSTRUCTION SOLVES PROBLEMS LATER

By BRIAN SILVA

Soil compaction is the most serious problem of intensively used turfgrass sites.

Brian Silva is a USGA Green Section agronomist for the Northeast region. He was graduated from the University of Massachusetts and taught at Lake City Community College in Florida prior to joining USGA.

An ideally completed round of golf on a par 72 golf course would find one using 36 of these strokes on the putting green. In addition to the time spent during play on the greens in a round, a similar amount of time is often spent discussing characteristics such as speed, color, shot holding capacity, surface grain and contours, and the like.

Certainly greens receive the closest scrutiny of any feature on the golf course. This attention requires that great care be taken in the design and construction of putting greens and their immediate surroundings.

Architecturally, a putting green should appear natural, as if it were part of the original site. Putting surfaces and collars should be designed so that surface water is drained away rapidly and efficiently. Contouring of the green should provide a minimum of two, and preferably, three or four directions in which surface water can flow. No more than 60% of the surface run-off should be drained in a single direction. Water should be directed away from the normal line of play, yet all too often greens are designed with a single surface drainage pattern which directs the water to the approach area of the

Continues on page 50

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front of the green. This approach area is perennially wet and susceptible to mower damage, disease incidence, compaction and annual weed encroachment. In cold climates, these back-to-front drainage greens are susceptible to ice cover formation as snow cover melts at the rear of the green during the warm part of a winter day. The water then has to travel the length of the green in leaving the putting surface and often refreezes as temperatures drop in the late afternoon and early evening. Additionally, low spots and pockets should be avoided as should channeling of the water over restricted portions of the green collar.

Contemporary greens are raised above fairway level as opposed to the fairway-type greens found on many older courses. The raised green offers greater visibility and shot holding characteristics, allows improved surface drainage and also permits better air drainage and circulation.

The architectural tenet "form follows function" can well be applied to putting green design. For example, a green on a long par 4, where a golfer would be expected to play the approach shot with a fairway wood or long iron, should be designed with a long axis. If bunkered, the bunkers should be wide set, allowing the golfer the opportunity to roll the shot to the green. Conversely, on a short approach, the golfer is expected to hit a high shot and the green can be fronted with bunkers and possess a relatively short axis. An approach shot of intermediate length would dictate a compromise of these two green designs.

While there are various methods of putting green and collar construction, there is general agreement on a number of points. First of all, a means must be provided for the removal of excess water. This removal will help to prevent the waterlogged conditions conducive to disease incidence, shallow rooting, inadequate aeration and overall poor turf condition. Secondly, the green must retain sufficient moisture and nutrients in the rootzone. Lastly, the putting green and collar should be resistant to compaction. Soil compaction is the most serious problem encountered on intensively used turfgrass sites.

The United States Golf Association Green Section Specifications for Putting Green Construction represent the most thoroughly researched and tested method of putting green construction. Originally proposed in 1960, the Green Section specifications have been refined as a result of additional research and in-field experience.

This method of putting green and collar construction details a process by which the green and its immediate surroundings are constructed in layers. Subsurface drainage tile lines are covered with a four-in. blanket of pea gravel. An intermediate layer of coarse sand to a two-in. depth is spread evenly over the pea gravel and followed by a 12 to 14-in. layer of topsoil mixture.

Close adherence to these specifications will result in the formation of a perched water table. This perched water table will permit the relatively coarse textured topmix to markedly increase its water holding capacity. However, under conditions of heavy rainfall, the topmix of a green constructed in this manner will drain excess water rapidly. In short, the topmix can be made to hold more water than it would were layering not involved, but it cannot be made to retain water in sufficient quantities to be deleterious to plant growth.

Recent research has shown that the coarse sand layer can be omitted during construction under certain conditions. This intermediate layer functions mainly to prevent the washing of finer soil particles into the drainage system of the green and to assist in water retention in the topmix. Close to ten years of research has shown that a proper particle size relationship between the topmix and gravel can eliminate the necessity for the coarse sand layer without significantly reducing the water retention capacity of the topmix or damaging the gravel layer through particle migration during drainage. The decision regarding the necessity for the coarse sand layer can only be made through particle size analysis of the topmix and gravel to be used in construction.

The drainage tile is inset in four-inches of pea gravel, which is then covered with a layer of coarse sand and a foot of topsoil.

The success of any method of putting green and collar construction depends greatly upon the physical and chemical characteristics of the soil mixture or topmix in which the turf will be growing. The heavy traffic received by greens and collars requires that the topmix be sufficiently resistant to compaction in order to retain the aeration essential to the growth and development of a healthy root system. A proper infiltration rate will allow for the rapid movement of excess water into and through the soil profile. Again, the soil mixture should be able to retain moisture and nutrients in quantities sufficient for plant growth.

Native soils which provide these characteristics to the proper degree are almost nonexistent. In order to assure the proper characteristics, a soil mixture must be developed through the aid of physical soil analysis. The variability of available construction materials such as sand, soil and organic matter, and the required physical and chemical characteristics, rule out the determination of a topmix by any other means. Too many greens have been constructed, with less than desired results, from a soil mixture that "looked good" or was fine for growing agricultural crops.

Once the proper blend of materials has been determined for the topmix through extensive testing, the proper mixing of these materials becomes the next step in construction. Off-site mixing is essen-

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tial to the success of this step. Mixing materials on-site with a rototiller or similar machine simply proves to be an inadequate method of properly mixing soil. Attempts to uniformly rototill diverse materials such as sand, soil and organic matter to the depth required in putting green and collar construction fall short of the desired goals.

The initial USGA Green Section Specifications recommended that material to be used in construction of the collar be in place and shaped before the prepared topmix was placed on the green. However, this recommendation has been refined and now calls for the collar to be constructed to the same specifications as the green. The collar is subjected to levels of traffic and management similar to those imposed on the putting surfaces. Exacting construction specifications will permit the turf on the collars to respond positively to these conditions.

The final step in the construction process involves turf establishment. In many cases, the desire to get the green back into play as soon as possible results in establishment by sodding. This is acceptable only if the sod has been grown on a topmix that is exactly the same as that used in construction of the green. Sodding under any other circumstance results in a soil interface just below the turf which decreases the chances of success. In such instances, seeding or vegetative propagation by sprigging or stolonizing is certainly the preferred method of establishment from an agronomic point of view.

The specifications outlined here are somewhat exacting. Soil testing is essential to the success of this method. Many clubs choose not to construct putting greens to these specifications because they believe construction costs will be excessive. A properly constructed putting green is an investment that will pay dividends over many years. Proper soil and drainage characteristics will yield a healthy turf less susceptible to disease and annual weed encroachment. Problems associated with wet wilt and greens too wet to play should be minimized. Resistance to compaction will result in a healthier, more extensive root system which is able to exploit a greater volume of the soil profile in search of water and nutrients.

In situations where accepted specifications are not followed, no degree of maintenance expenditure will produce greens offering consistently good putting characteristics and agronomic conditions conducive to desirable plant growth. Green construction involving less expensive and less effective method can end up being more costly in the long run. Certainly there can be nothing more expensive than rebuilding a green.

Any method of putting green and collar construction will involve a sizable expenditure of funds. The USGA Green Section Specifications put the odds for success in such an endeavor well in your favor. **WTT**

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Thin crown and chlorotic foliage of this ponderosa pine in the San Bernardino Mountains identify it as more ozone sensitive than the more tolerant ponderosa pine on the left.

Typical chlorotic dwarf individuals of eastern white pine.

PART TWO

SPECIFY TOLERANT TREES FOR AIR POLLUTED AREAS

By DAVID F. KARNOSKY AND TED R. MYERS

In the first paper in this series on air pollution effects on shade trees (Weeds, Trees, and Turf, February, 1982), we discussed some of the most important air pollutants with regard to trees. This paper will examine methods of reducing air pollution problems on shade trees. Theoretically, all air pollution problems can be prevented by controlling pollutant sources. Whenever feasible, this approach to controlling air pollution problems should be taken ahead of all other solutions.

Significant reductions in the number of localized sulfur dioxide problems have been made in the past twenty years through technological advances such as stack scrubbers and tall smoke stacks and through the conversion of coal burning to oil burning (which results in less sulfur being burned).

Unfortunately, we will be faced with some major pollutant problems on trees for many decades to come. As long as the automobile remains our principal source of transportation, for instance, we'll likely continue to be faced with two related problems: ozone generated from photochemical reactions involving automobile exhaust products and salt spray related to the use of deicing salts for maintaining clear winter roads. Similarly, since it is likely that herbicides will continue to be used for weed control for the forseeable future, arborists will probably continue to be faced with herbicide drift problems on trees.

These pollutants can be reduced by minimizing automobile emissions and by encouraging wiser and more moderate use of deicing salts and herbicides. Some pollutant problems can also be reduced by various cultural treatments. For example, fertilizing eastern white pine trees can make them less susceptible to injury from sulfur dioxide (Cutrufo and Berry, 1970) and ozone (Will and Skelly, 1974). European studies have shown that European beech and elm are more tolerant to sulfur dioxide when grown on good soils than on nutrient-deficient soils (Guderian, 1977). The addition of gypsum to soils can be helpful in reducing salt damage to trees growing near roadways (Rubens, 1978).

Because trees vary greatly in their responses to air pollutants, some pollutant problems to shade trees can also be minimized by selecting pollution-tolerant trees for plantings in areas where a known pollutant prevails. The remainder of this paper will examine variation in pollutant responses of trees and discuss how this information can be used.

Variation in Pollutant Responses

Tree species, varieties, cultivars, and individuals within a species may react differently to a given air pollutant. Although there is no absolute resistance to gaseous air pollutants, trees do vary from being highly tolerant to being very sensitive to air pollutants. The importance of species-specific differences in tolerance was first noticed where pollution concentration gradients were located around single pollutant sources. For example, Scheffer and Hedgcock (1955) and Gorden and Gorham (1963) reported differences in the severity of sulfur dioxide injury to trees around ore smelters. Linzon (1965) noted similar differences between tree species around petroleum refineries emitting large amounts of sulfur dioxide.

During the 1960's, extensive damage to trees caused by photochemical oxidants (primarily ozone) was reported in the San Bernardino Mountains of southern California. Here again, considerable variation was seen in the response of trees, as some tree species (digger and singleleaf pinyon pines) were quite tolerant and others (Colter, Jeffrey, Monterrey, and ponderosa pines) were sensitive (Miller and Millecan, 1971). Field observations along northern highways have also revealed that trees vary widely in their tolerances to deicing salts (Lumis *et al.*, 1973; Shortle and Rich, 1970).

Although it is often overlooked and is not as well publicized, there may be as much variation within tree species in air pollution responses as there is between species. Several researchers have described extensive variation within species in pollutant responses as determined by controlled fumigations with sulfur dioxide and ozone. Karnosky (1980, 1981) has also described within-species variation in ozone responses from field observations.

Understanding Tolerance Lists

To effectively utilize the variation in pollutant responses in order to select tolerant trees for

Continues on page 60

Dr. Dave Karnosky is a forest geneticist of the New York Botanical Garden's Cary Arboretum in Millbrook, NY. Ted Myers is director of research and development for Cottage Gardens, Inc., Lansing, Michigan.

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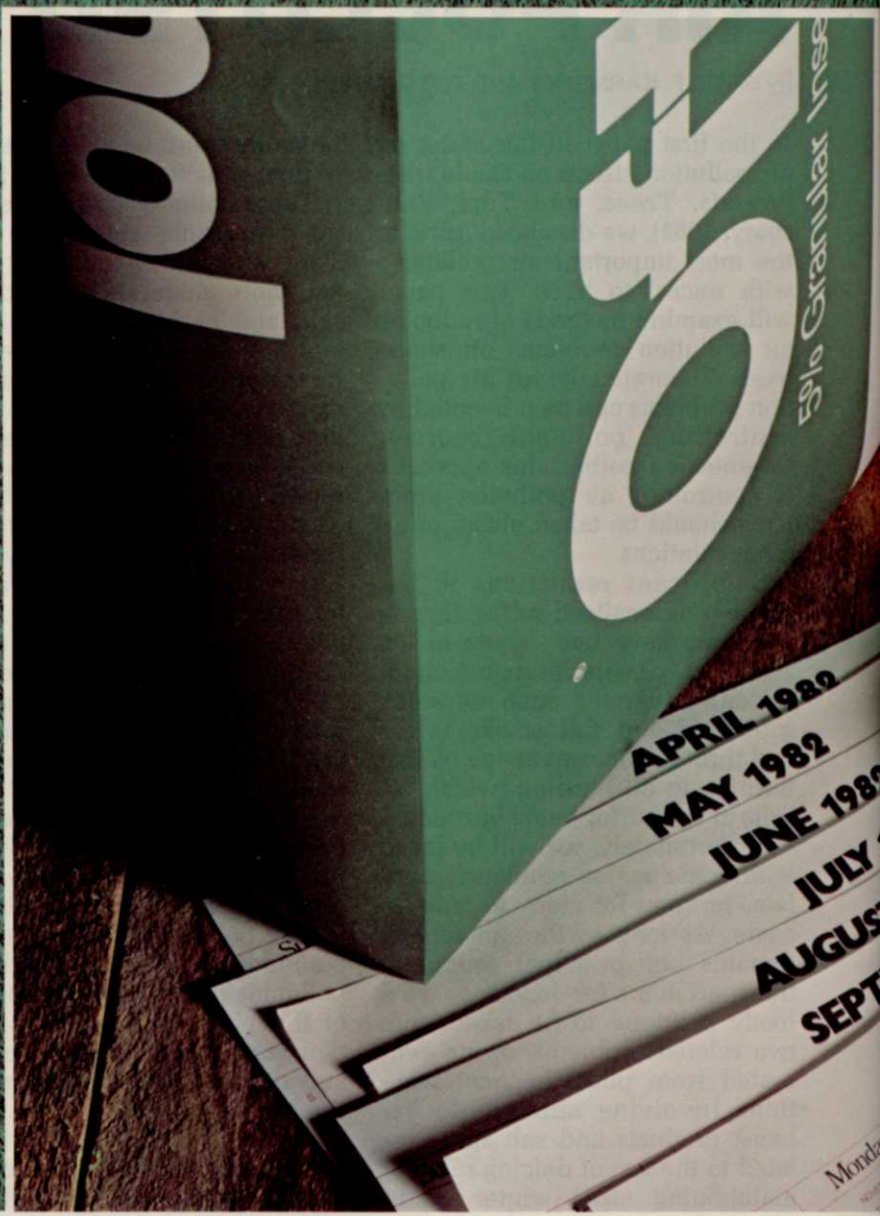

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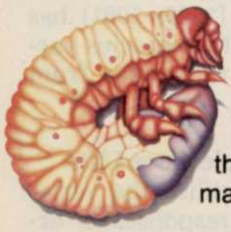

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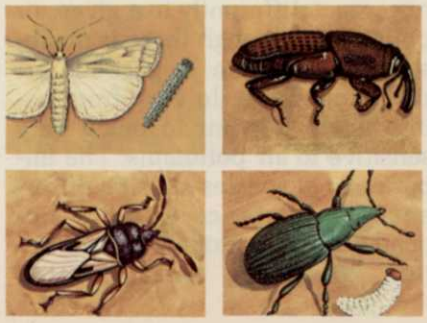

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planting in areas with pollution problems, one must examine the many lists available and decide which ones are most appropriate for your situation. It is important to understand that these lists can only be used as general guidelines. They often present conflicting information, depending on where and how the study was conducted. Also the lists commonly have two inherent limitations: 1. variation within a species cannot be adequately described; and 2. tolerance rankings generated from chamber fumigations may not relate well to those determined in nature.

The first limitation is evidenced by the situation with eastern white pine. This species is consistently blacklisted as being sensitive to ozone and sulfur dioxide pollution. However, eastern white pine is a highly variable species and has individual trees with a wide range of pollutant sensitivities. In the senior author's studies in southern Wisconsin, the ozone-sensitive trees make up less than 5% of the native population, the trees with intermediate sensitivities occur in about 8% of the population, and the remainder of the trees are ozone-tolerant. At the New York Botanical Garden in the Bronx, New York, there is a healthy stand of old eastern white pine trees that have survived high ozone and sulfur dioxide levels over the past 50 years. The senior author is beginning to propagate individuals from the Wisconsin and New York locations to build up stocks of eastern white pine genotypes with known pollutant responses. The tolerant trees from this work may be used in areas where pollution problems on eastern white pine might otherwise occur, and the sensitive individuals may be eventually used as bioindicators of the presence of air pollution.

The second limitation of many tolerance rankings is that they were developed from chamber fumigations of seedlings grown under artificial conditions. The seedlings used in these studies may not be representative of how mature trees respond to air pollutants. Furthermore, these studies generally use short duration, acute fumigations of single pollutants, whereas trees in nature are usually exposed to chronic fumigations and are often exposed to more than one pollutant at the same time. One other important consideration with these chamber studies is that the plants are generally grown in containers and under optimum growing conditions which are not necessarily typical of the natural environment.

TABLE 1.
Relative tolerances of shade trees to ozone. The number of cultivars studied are noted in brackets.

Tolerant	Red maple
Black gum	River birch
Blue ash	Saucer magnolia
Callery pear (7 cultivars)	Scarlet oak
Chinese elm	Shumard oak
Cucumber tree	Silver linden
European alder	Silver maple
European ash (2 cultivars)	Sugar maple (6 cultivars)
European beech (2 cultivars)	Sweetgum (2 cultivars)
European mountain-ash	Sycamore maple
Flowering ash	White ash 'Autumn purple'
Ginkgo (6 cultivars)	**Sensitive**
Green ash 'Summit'	Big-leaf linden 'Fastigiata'
Honeylocust 'Emerald lace'	Big-leaf linden 'Orebro'
Honeylocust 'Majestic'	Crimean linden
Honeylocust 'Moraine'	Crimean linden 'Redmond'
Honeylocust 'Rubylace'	English oak 'Fastigiate'
Honeylocust 'Skyline'	Honeylocust 'Imperial'
Japanese pagoda tree 'Regent'	Kentucky coffee tree
Norway maple (15 cultivars)	London plane tree 'Bloodgood'
Pin oak 'Sovereign'	Ohio buckeye
Pumpkin ash	Sycamore

TABLE 2.
Relative tolerances of trees to aerial drift of deicing salt.

Highly Tolerant	**Very Sensitive**
Conifers:	Conifers:
Austrian pine	Eastern hemlock
Colorado blue spruce	Eastern white cedar
Eastern red cedar	Eastern white pine
European larch	Norway spruce
	Red pine
Hardwoods:	Scots pine
Black locust	White spruce
Eastern cottonwood	
Gray birch	Hardwoods:
Honeylocust	Allegany serviceberry
Norway maple	American beech
Pin oak	American linden
Red oak	Box elder
Tree-of-heaven	English holly
White ash	European beech
White poplar	European horn beam
Yellow birch	Hackberry
	Red maple

Relative Tolerances

Given the numerous problems relating to the ranking of relative pollution tolerances, the reader might not expect to see any such lists presented in this paper. However, we feel that there are two pollutant problems, ozone and deicing salts, in which adequate information is known about tree responses in the field so that the relative tolerances are reliable. For ozone, the senior author has been examining field responses of common shade trees for the past

Continues on page 62

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five years. In Table 1, the results of this work are summarized. The trees listed as sensitive have been observed to suffer ozone-induced foliar injury in field plots. This injury has generally consisted of upper leaf surface stipple or flecking and/or premature leaf drop. Trees listed as tolerant have not shown any injury symptoms.

In Table 2, we've summarized research findings on the relative susceptibility of some common shade trees to deicing salt spray. This list utilizes information from several studies, including those by Lumis *et al.* (1973) and Shortle and Rich (1970). Since roadside trees subjected to deicing salt spray drift are also commonly faced with toxic salt build-up in their soil, this listing only contains tolerant trees that are also tolerant to salt accumulation in soils.

Summary

Air pollution continues to be an important stress factor on shade trees. Pollutants that are particularly damaging to trees are ozone, sulfur dioxide; hydrogen fluoride, herbicide drift, and deicing salt spray.

Acknowledgment

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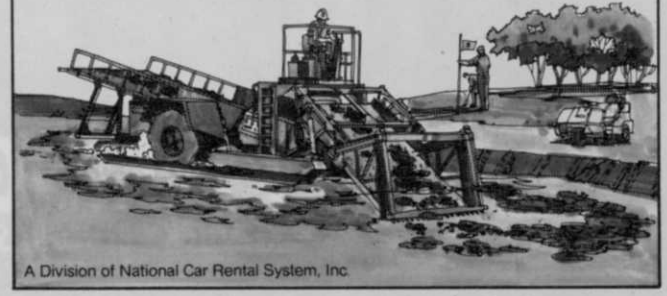

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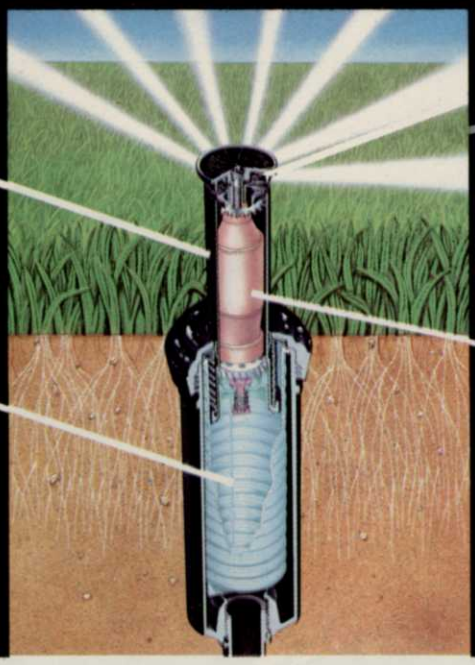

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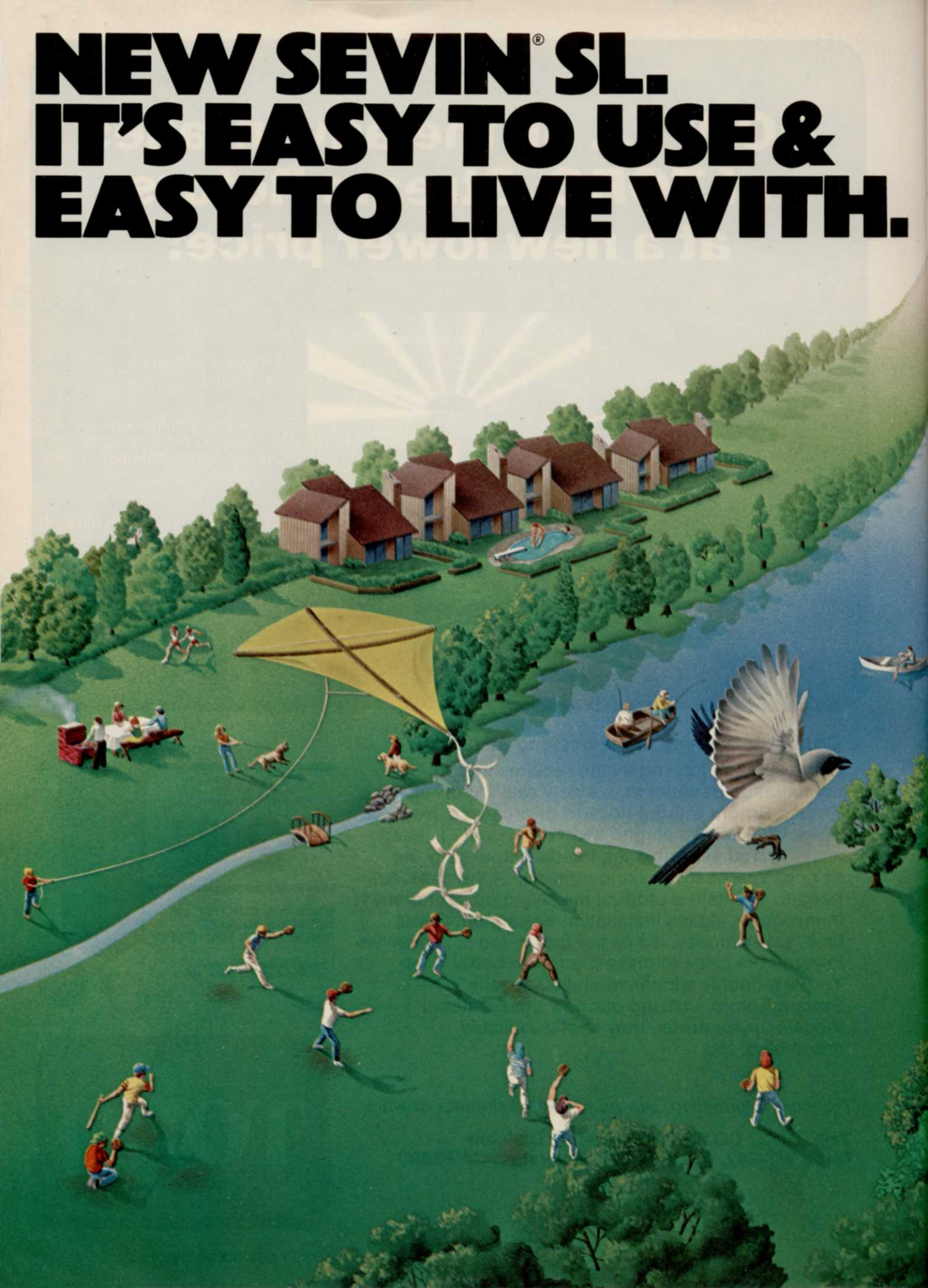

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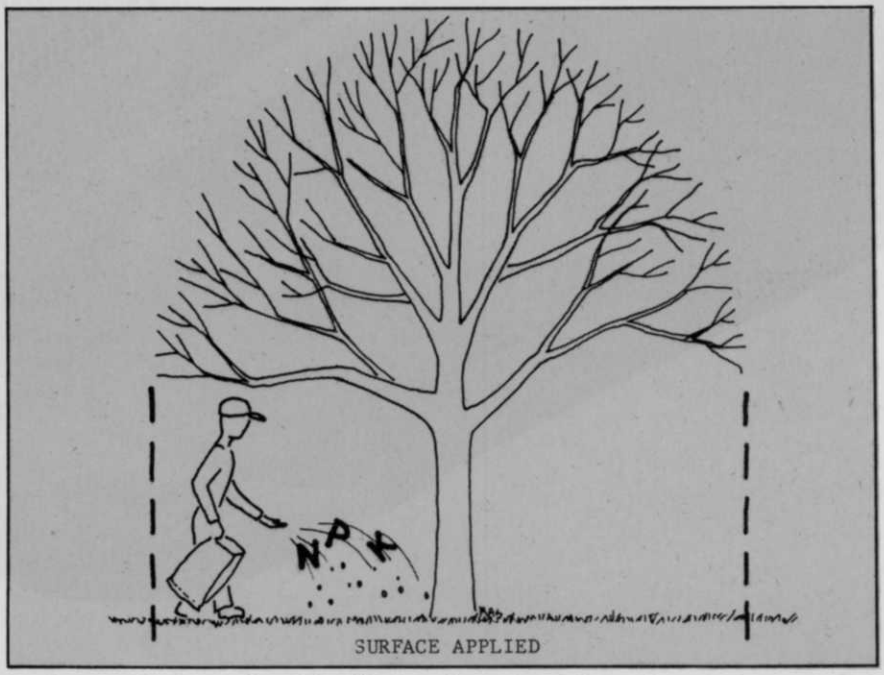
FERTILIZER FACTS:

TIMING AND METHODS FOR LANDSCAPE TREES

By DOUGLAS J. CHAPMAN



Surface application of turf fertilizer at three times the turf rate prior to spring green-up but after the soil thaws is most effective.

Fertilization of trees is one of the key practices for grounds management. Timing and method of application are paramount in tree culture. The questions remain: when does a tree need fertilizer, how much, and with what? These questions and the method of application need to be answered when developing long-term goals for landscape maintenance.

The symptoms of poor health or vigor of a tree are manifested in small, paler leaves, little or no annual growth, twig elongation or trunk diameter, and increased amounts of dead wood within the tree. If any of these symptoms appear in your tree, fertilization is in order.

Trees that are fertilized generally are less suscept to borer attack, look better, have more intense fall color, are better able to withstand drought and/or one or two insect defoliations, and, lastly, are more resistant to diseases, e.g. Verticillium Wilt or Shoestring Root Rot.

Timing of fertilizer application is particularly important. Work done by Neely at the University of Illinois and by Chapman, Reisch, and Chadwick of Ohio State showed clearly that timing of application greatly increased the plant's response; that is, fertilizer should be applied to the tree prior to the commencement of growth in the spring.

Soil type will have some effect on when to apply fertilizer. For sandy or loam soils spring application after the frost is out of the soil and before bud break is best. For clay loams fertilizer can be applied late in the fall, e.g. mid-November, prior to the soil freezing but after leaves have fallen or the plant is completely dormant.

Having the fertilizer available in the root zone at or slightly prior to commencement of growth in the spring, results in the maximum plant response. That does not mean if one has a tree with disease or in poor vigor that some fertilization any time wouldn't help, but for maximum response, fertilizer applied in spring is best. This also integrates well into an overall management program.

There has been much discussion as to how to apply fertilizer. For years the recommendation was based on trunk diameter, e.g. three to five pounds 10-6-4 of fertilizer per inch of diameter and putting holes every two feet apart in concentric rings from two feet from the trunk to the foliage line. These holes would be twelve to fifteen inches in depth. This pinch-bar method is effective in providing plant nutrients to the tree but often causes damage to the lawn and unsightly holes in the sod and damages some roots.

Some recommended the application of foliar fertilizers, that is, applying the fertilizer during the growing season, dissolved in water and sprayed on the foliage of the plant. The general recommendations have been well developed, e.g. 50 ounces per 100 gallons of water. Some absorption does occur through the leaf but maximum absorption of fertilizer is from the soil by the roots.

The third and best method of applying fertilizer is the application to the soil surface of fertilizer prior to growth starting in the spring. The rate is three to five pounds of actual

Continues on page 68

Douglas J. Chapman is a Horticulturist at Dow Gardens, Midland, Michigan

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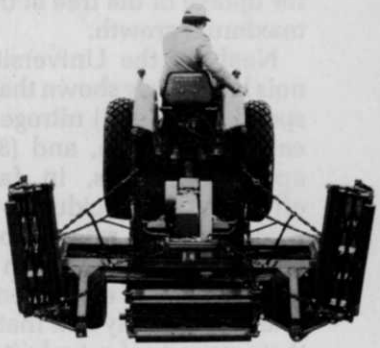

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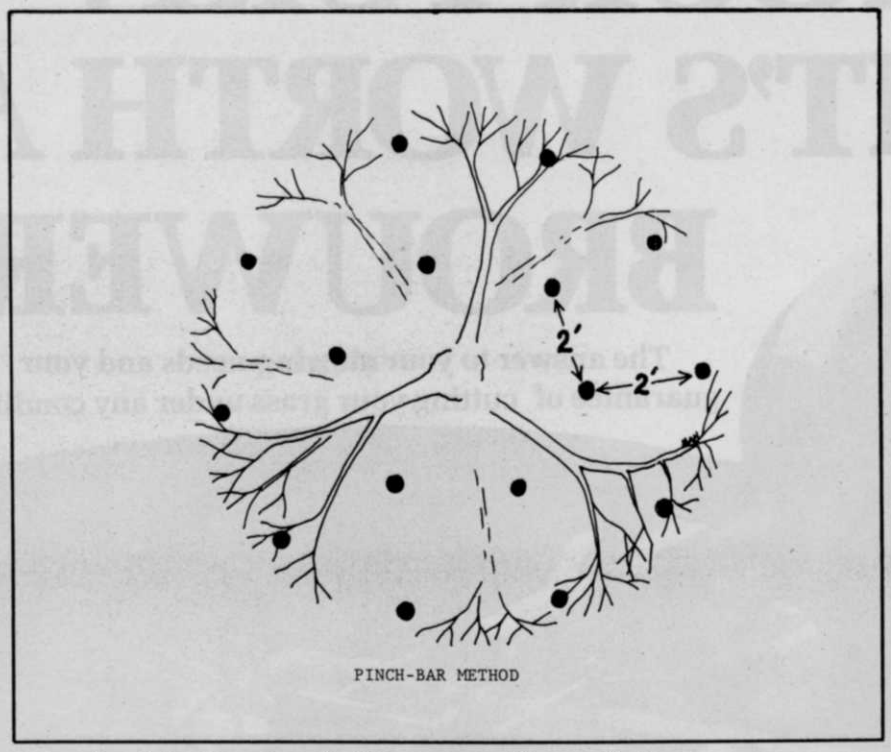

Subsurface injection of tree fertilizers may not be practical under average maintenance conditions. If used, holes should extend to the edge of the canopy and be 12- to 15-inches apart.

nitrogen per 1,000 square feet on soil surface under the canopy of the tree. This recommendation is valid for large and small trees. The application time is after frost leaves the soil yet before grass growth starts. This results in little or no damage to the turf, yet the fertilizer is leached into the root zone, thus available for uptake of the tree at the time of maximum growth.

Neely of the University of Illinois has clearly shown that trees respond most to (1) nitrogen and (2) early application, and (3) surface application was, in fact, most effective. For deciduous trees, the recommended rate is four to six pounds of actual nitrogen per 1,000 square feet. For evergreen trees the rate is essentially half that or two to three pounds of actual nitrogen per 1,000 square feet. This fertilizer can be applied in the form of ammonium sulfate, urea, or as a complete fertilizer, e.g. 18-4-12.

One must realize that the tree's maximum response is to nitrogen. When considering the other two nutrients (phosphorus and potassium) the recommendations vary and vary significantly.

If one has opportunity to review the literature, there are very few times phosphorus has been proven to be deficient. Trees are very efficient extractors of soil phosphorus.

Potassium is needed in amounts of one-half to two-thirds that of nitrogen per 1,000 square feet or one and one-half to three pounds per 1,000 square feet of soil surface under the tree canopy. Potassium is a relatively mobile nutrient and, therefore, although much less leachable than nitrogen, it can be surface applied with effectiveness.

Pragmatically speaking, unless some unique condition exists, probably most maintenance superintendents could apply a lawn fertilizer, such as 18-4-12 at two to three times the recommended turf rate early in the spring prior to the commencement of growth with the result—healthy, vigorous trees.

Micronutrients—

The two micronutrients generally reported to be deficient are iron and manganese. The problem of iron deficiency is related to soil pH and the plant's ability to extract iron in sufficient amounts. The symptoms include pale green leaves with dark green venation. It is most commonly a problem on Pin Oak, although iron deficiency has been noted on Norway Maple, Sugar Maple, and Red Maple, to mention a few. It can be corrected by the foliar application of chelated iron (as recommended on the label), soil application of iron sulfate or sulphur, or, most recently, as recommended by E.M. Smith at Ohio State, the use of Medicaps. This method is boring holes in the trunk of the tree and putting in a small plastic cap containing iron citrate which is absorbed by the plant. This is the most rapid method to correct iron deficiency. Generally speaking, the earlier the application of any of the above materials, specifically before bud break, is optimal.

Having the fertilizer available in the rootzone at or before commencement of spring growth results in maximum plant response.

Managanese deficiency was originally researched by Kielbaso at Michigan State University. His work showed that many street trees were, in fact, manifesting symptoms similar to iron deficiency but were suffering from a lack of adequate amounts of magnesium. Several methods have been tried, e.g. manganese sulfate (soil or foliar applied), but the Medicap technqiue seems most responsive.

Generally speaking, trees need to be fertilized every one to three years. They are more in need of fertilizer in turf situations than in native stands. When considering fertilizer applications, one should apply the fertilizer at the rate of two to six pounds of actual nitrogen per 1,000 square feet of area up to the tree canopy on the soil surface after the frost is out of the soil, before commencement of growth.

This method of fertilization not only lends itself well to an overall grounds maintenance program but reduces damage to turf and results in healthier, more vigorous trees better able to withstand the ravages of insects, drought, and disease. **WTT**

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58
Technical communications

Although the Tech Rep is the key communication channel, ProTurf keeps its clients up to date by other means, too. ProTurf publishes two free magazines to circulate information to the industry: "ProTurf," directed to improving golf course turf management; "Turf & Grounds Manager," directed to turf managers of companies, apartments, athletic fields, parks and lawn service firms. Additional data are included in technical bulletins, product guides and general materials.

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WT&T

VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

Q: *Is it true that turf under trees will benefit if trees are deep root fertilized rather than surface fertilized? (Pennsylvania)*

A: Turfgrass growing under shade has a lower nitrogen requirement than the same species in sunlight. Excessive nitrogen produces succulent growth that is more susceptible to injury from disease and wear. This is particularly true for shade-tolerant species such as red fescue which does not tolerate excessive fertilization.

Q: *We have about 50% Poa annua in our bluegrass fairways and bentgrass greens. Water is applied for the greens only. When the poa goes out in the summer, silver crabgrass comes in to replace the poa. The problem gets worse with more silver crabgrass each summer. What program can we start in order to solve these problems? (Virginia)*

A: As you are no doubt aware, *Poa annua* is difficult, if not impossible, to eradicate once it has become established. In many cases, the most practical solution is to give up control attempts and direct your management practices toward maintaining the annual bluegrass.

To discourage *Poa annua*, avoid cold weather applications of nitrogen, mow at the highest practical setting for each turfgrass species, reduce shade, correct acid soils, relieve compaction and apply phosphorus only when indicated by a soil test. Clipping removal during seedhead formation also has reduced the incidence of *Poa annua*. Unfortunately, none of the currently labeled herbicides provide satisfactory control.

To control goosegrass (silver crabgrass) in Kentucky bluegrass, oxadiazon is reportedly more effective than the other labeled herbicides but may cause temporary discoloration. In bentgrass, the recommended preemergent herbicides are benefin, bensulide and DCPA. Postemergent herbicides such as DSMA or MSMA are most effective when applied to crabgrass in the juvenile stage.

Reseed the areas where heavy crabgrass infestations were controlled with compatible Kentucky bluegrass or bentgrass in late summer. Depending on the herbicide used and the time interval between its application and the reseeding process, activated charcoal may be necessary to allow adequate germination.

Q: *How can you tell the difference between leaf distortion and yellowing on shrubs caused by sucking insects and that caused by lawn herbicides? (Ohio)*

A: If insects are involved, you generally can find the insect or evidence of its presence such as cast skins or honeydew, especially if a 10X hand lens is used. Other factors such as temperature extremes and foliar diseases can also cause growth distortions and discoloration and should be considered when diagnosing a problem.

Q: *A client would like us to plant several apple trees and use the fruit for both eating and cooking. Can you recommend a variety that will grow in our area. We need the information in time for planting this spring. (Ohio)*

A: The following chart, compiled by Dr. Richard Miller, Extension Entomologist at Ohio State University, and published in *Bug Dope* in 1977, should be helpful in selecting varieties suitable to the needs of the home owner planning to plant apple trees.

Send your questions or comments to: Vegetation Management c/o WEEDS TREES & TURF, 757 Third Avenue, New York, NY 10017. Leave at least two months for Roger Funk's response in this column.

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Wealthy	9/1	Fair	Fair[c]	Good	Fair[t]	Fair[ct]
Jonamac	9/10	Excellent		No Information		
McIntosh	9/12	Good	Good[c]	Fair[ct]	Fair[t]	Poor[ct]
Spartan	9/28	Excellent	Good[c]	Fair[ct]	No inf.	Fair[ct]
Cortland	9/28	Excellent	Excellent	Fair[ct]	Good	Fair[ct]
Macoun	10/6	Excellent	Good[c]	Fair[ct]	Poor[ct]	Poor[ct]
R.I. Greening	10/3	Poor	Fair[c]	Good	Good	Good
Jonathan	10/6	Excellent	Excellent	Excellent	Good	Good
Twenty Ounce	10/6	Fair	Good	Excellent	Good	Good
Empire	10/6	Excellent	Good	Fair[c]	?	Good
Northern Spy	10/8	Excellent	Good	Excellent	Excellent	Excellent
Red Delicious	10/9	Good	Fair[ft]	Poor[cft]	Poor[ft]	Poor[cft]
Jonagold	10/12	Excellent	Excellent	Good	Good	Good
Golden Delicious	10/15	Excellent	Excellent	Excellent	Good	Good
Idared	10/15	Fair	Excellent	Good	Excellent	Good
Rome	10/22	Poor	Good[f]	Good[c]	Good	Good
Mutsu	10/22	Excellent	Good	Excellent	Excellent	Excellent

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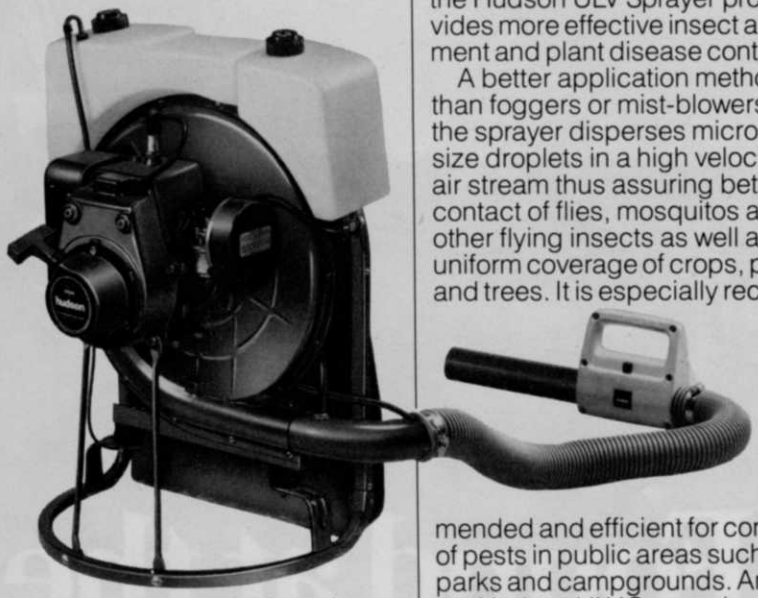

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LETTERS

Catalpa caterpillars

In reference to Mr. Douglas J. Chapman's article on "The Forgotten Trees" which appeared in the November issue I would like to make the following comments.

I agree that the Catalpa (Catalpa speciosa) is a forgotten tree in the landscape but it can be quite interesting. However, I had never pictured it in a landscape plan.

Growing up in the South, I saw it quite frequently, mostly out in the county on farms just as a misplaced tree. However, the tree serves another purpose in an unusual way.

The Catalpa Sphinx moth caterpillar (Ceratomia catalpae) enjoys the green leaves during the early summer months. These creatures, I have been told make excellent fish bait for farm ponds, creeks and streams. Some people actually harvest them for sale. To my knowledge they do not attack anything else.

Anyone considering this tree for a place in the landscape should remember that they do have a disadvantage or maybe you could call it an advantage.

Arthur B. Clark
Georgia Southwestern College

Nursery research

The nursery industry shows its traditional positive response to overcome problems noted in the field. During the past several years, we have discussed tree types and cultivars used in the landscape to improve the quality of the landscape while reducing maintenance costs. Not only at Dow Gardens have we been evaluating trees with maintenance considerations but also the Ohio Research and Development Center; Lester Nichols, Penn State (crab apple varieties); new propagation techniques worked on at Rutgers; Bill Collins, Amfac Cole Nursery; and Frank Santamore of the National Arboretum, to mention a few. The results of good communication between institutions, the nursery industry, arborists, and universities are appearing in the trade. Although space is limited, I would like to highlight three areas of cooperation and response. Further, I would like to stress that these are only examples—many others exist.

In 1979 we discussed "Results of Crab Apple Varieties Showing Resistance to Apple Scab and Fireblight in Central Michigan." But even before our work, Dr. Lester Nichols at Penn State had been looking at a similar response for his area and L.C. Chadwick and E.M. Smith at Ohio State did a similar work for their area. The result is becoming evident. One of several specific examples I would like to mention is Frank Schmidt and Son Nursery, Boring, Oregon—recent offering of crab apple. (Note that the crab apples available, e.g. "Mary Potter," "Professor Sprenger," and "Snowdrift," to mention a few, are all varieties reported highly resistant to apple scab and/or fireblight.) Another example is Simpson Nursery, Vincennes, Indiana—development of disease resistant cultivars, e.g. "Centurian," "Indian Summer," and "Sentinel."

Graft incompatibility with Red Maple was first noted by Dr. Harold Davidson at Michigan State University. In the ensuing years, others noted graft problems with "Bloodgood" London Planetree, "Sovereign" Pin Oak, and "Autumn Purple" White Ash. It had been postulated that propagation by cuttage and/or tissue culture would eliminate this provenance-induced incompatibility, i.e. the grafted varieties native to one part of the country grafted on a seedling root stock native to a different area, with the result—incompatibility or, to quote Dr. Davidson, "incongeniality." The first reported propagation of *Acer rubrum* cultivars by cuttage was by Orton at Rutgers in 1978 at I.P.P.S. I reported research from Dow Gardens on "Propagation of *Acer campestre, A. platanoides, A. rubrum,* and *A. ginnala* by Cuttings" in 1979 at I.P.P.S. Further, in 1981, reports at the International Plant Propagators Annual Meeting included a paper given by Joerg Leiss, Sheridan Nurseries, Ontario, discussing, "Propagation of *Syringa reticulata* by Cuttage," and work by Chapman and Hoover on "Propagation of Shade Trees by Softwood Cuttings." It is exciting to now see cultivars of *Acer rubrum* propagated by cuttage being offered by some nurseries, e.g. William Moller of Gresham, Oregon.

Provenance is a key consideration that must be part of introducing new cultivars. It is particularly important that regional cultivars be introduced. Several examples of nurseries offering regional cultivars are Weston Nurseries, Hopkinton, Massachusetts and Frank Schmidt and Son Nursery of Oregon. These nurseries are trying to either develop and/or propagate locally-adapted cultivars for their region (Weston—*Pinus rigida* "Sherman Eddy," *P. strobus* "White Mountain," and *Chamaecyparis thyoides* "Hopkinton"), or using cultivars developed by other institutions, e.g. the University of Minnesota—"Northwood's variety of *Acer rubrum*, being offered by Frank Schmidt and Son Nursery. Responses of this type by the nursery industry show clearly the desire of many plantsmen to offer for sale the highest quality of plant material available. Finally, if a problem is noted, develop a positive response which results in a more beautiful-healthy landscape.

Douglas Chapman
Horticulturist, Dow Gardens

Gypsy moth wind-down

I read with interest the article entitled "Gypsy Moth Invasion Runs Arborists Ragged" in the September, 1981 issue of *Weeds Trees & Turf*. I thought it presented an excellent representation of the situation as it is.

It occurred to me that a follow-up article that might be of interest to your readers in the near future could deal with preparing arborists to wind down from gypsy moth problems. Many of us who were in the business in the 40s and 50s (when previous outbreaks of gypsy moth placed a severe burden on our companies) know how important it was for us to learn how to shift gears quickly when the problem began to dissipate; and to find other uses for our equipment in order to receive a reasonable return on our capital investment.

Some unique situations have developed in the past few years that are different from some of the problems we faced in past years. In the old days, many of us could shift into the area of Dutch Elm disease control using DDT with our equipment. This is no longer possible. Spray personnel with certain characteristics making them eminently suitable for work in the spray department but not for other work in the arborist field have to be handled in a manner that maintains production. There are many points that could be covered that would assist arborists in shifting into a more realistic concept of insect control for the future.

I hope you agree with me and that such an article will be published when time permits.

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Circle No. 160 on Reader Inquiry Card

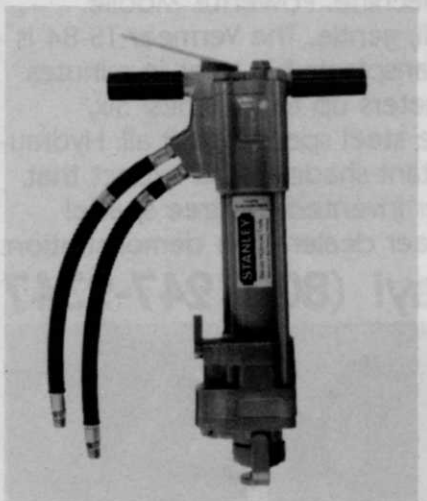
PRODUCTS

John Deere has introduced a new compact utility tractor that provides 18 hp at the PTO. Powered by a 3-cylinder, water-cooled 78.2 cubic-inch diesel engine. The 750 features a sliding gear

transmission with eight forward and two reverse speeds, and a ground clearance of 15 inches. Power steering and mechanical front-wheel drive are optional.

Circle No. 165 on Reader Inquiry Card

The HD45 Hammer Drill from Stanley Hydraulic Tools can drill 1-in. to 2-in. diameter holes up to 30 inches deep. Features include adjustable bit rotation



(either forward or reverse) which allows the operator to choose BPM/RPM ratios. The HD45 is available in either open-center or closed-center models.

Circle No. 166 on Reader Inquiry Card

Great Plains Industries, Inc., has developed a new herbicide pump and meter to handle a variety of bulk chemicals either alone or in combination. The GPI pump and meter features seals that are designed to extend unit life and

are compatible with most popular bulk herbicides, a spin collar for easy installation, and a nozzle dust cover.

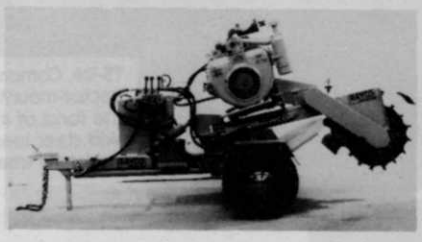
Circle No. 167 on Reader Inquiry Card

Simonsen Manufacturing Co.'s turf-fertilizer spreaders were designed for accuracy, maneuverability, versatility and minimum soil compaction.

Spreading from 90 to 1,000 lbs. per acre can be dialed on the featured Spread-Rate selector. The model's single axle design is intended to eliminate the tearing of turf, especially on sharp corners.

Circle No. 168 on Reader Inquiry Card

Rayco Manufacturing Inc. has introduced its model RG 1635 heavy duty stump cutter. The compact, low silhouette design has a 35-hp Wisconsin engine, hydraulic controls, and a 22½-in. cutting wheel to chew out stumps up to



14-in. deep. Other features include an electrically welded square tubular frame, and a 14 gallon capacity fuel tank.

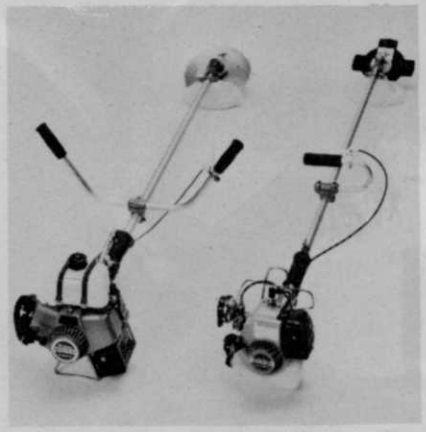
Circle No. 169 on Reader Inquiry Card

Lakos Separators have introduced a new in-line series of solids-from-liquids separators. The line differs from the carbon steel units in that th

are manufactured entirely from lightweight ABS plastic. Individual models are available for flow rates from four to 105 U.S. gpm, with other models capable of handling rates up to 525 gpm.

Circle No. 170 on Reader Inquiry Card

Lanco's lightweight brush cutters are now available in three models, each with a range of interchangeable blades and nylon trimmer attachments. The line of Robin Brush Cutters are powered by 15.4 through 37.7 cc engines,

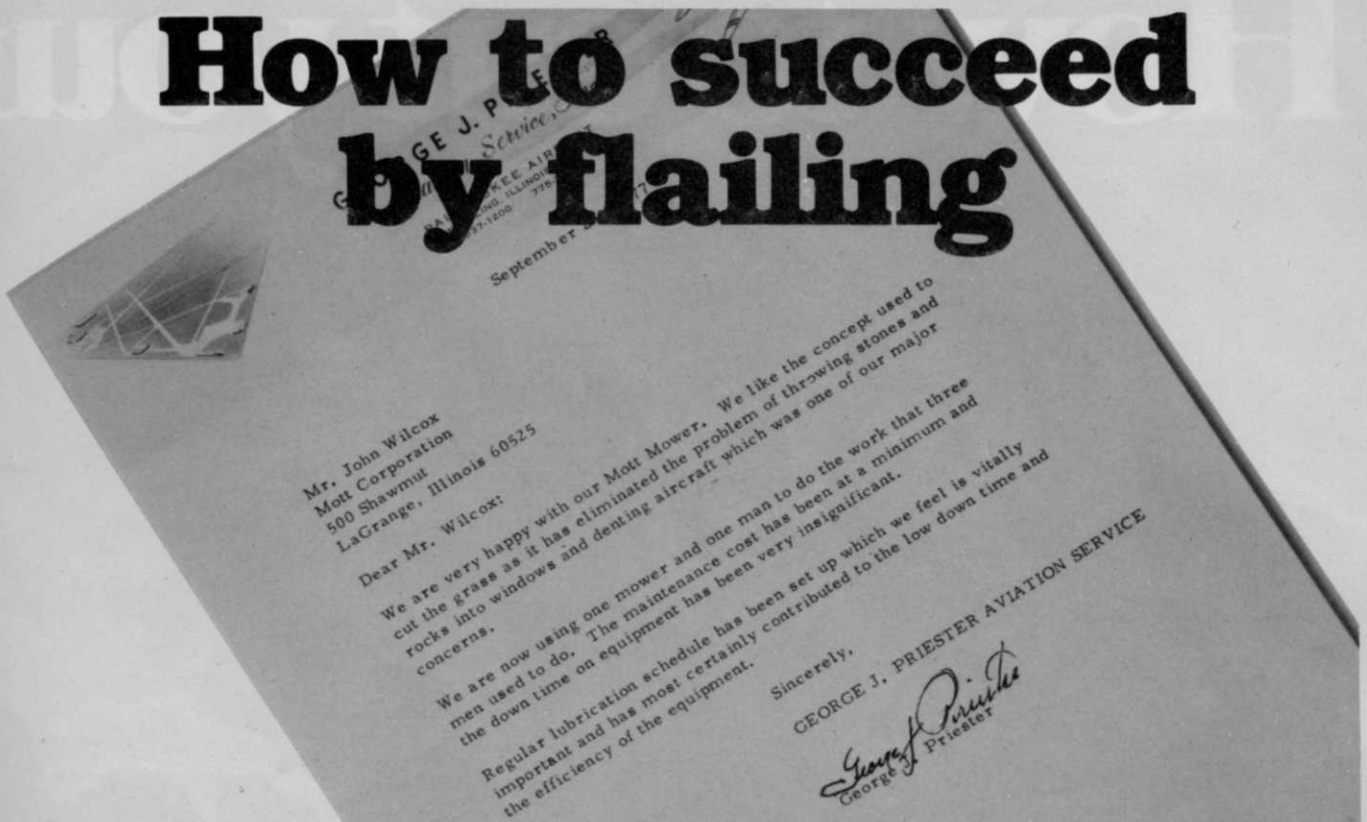


featuring diaphragm carburetors, recoil starters, and automatic centrifugal clutches.

Circle No. 171 on Reader Inquiry Card

Continues on page 82

How to succeed by flailing



Mr. John Wilcox
Mott Corporation
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LaGrange, Illinois 60525

Dear Mr. Wilcox:

We are very happy with our Mott Mower. We like the concept used to cut the grass as it has eliminated the problem of throwing stones and rocks into windows and denting aircraft which was one of our major concerns.

We are now using one mower and one man to do the work that three men used to do. The maintenance cost has been at a minimum and the down time on equipment has been very insignificant.

Regular lubrication schedule has been set up which we feel is vitally important and has most certainly contributed to the low down time and the efficiency of the equipment.

Sincerely,

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Super Heavy Duty
48", 60", 74", 88"
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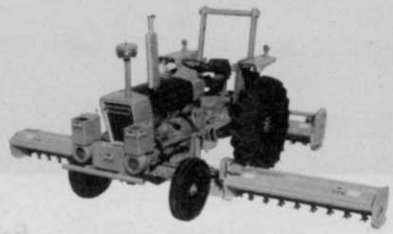
540 PTO, fine cut only



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Circle No. 136 on Reader Inquiry Card

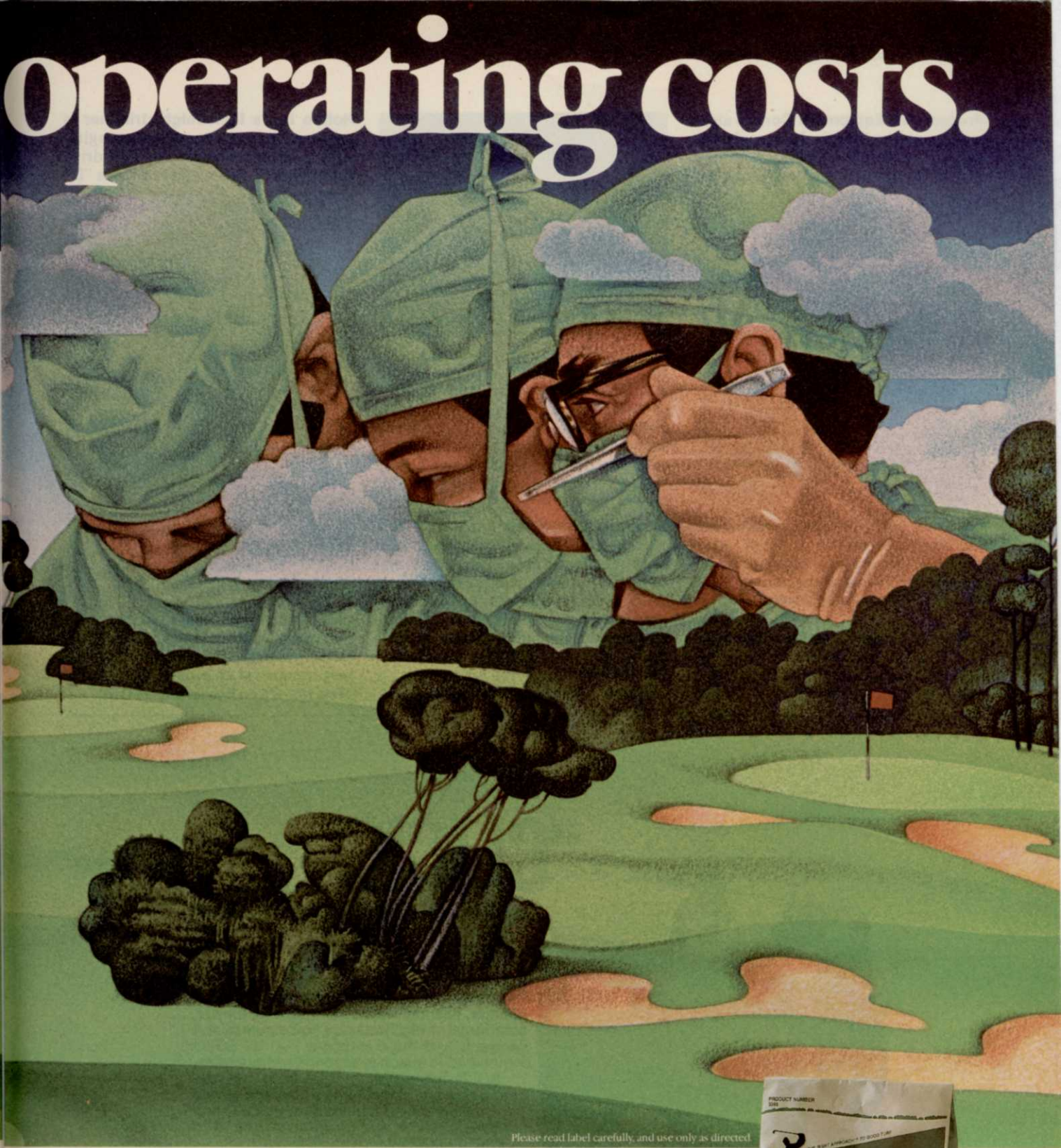
How to cut your

Long-lasting Chipco® 26019 fungicide is as good for your budget as it is for your turf.

Because it gives you the longest residual activity, you'll need fewer treatments on greens and tees with Chipco 26019. And fewer treatments on fairways, where it controls diseases longer...from 21 to 28 days. So for every treatment you eliminate thanks to Chipco 26019, you'll save up to $10 an acre in fuel and labor!

And Chipco 26019 is strong medicine. No other fungicide gives better control of the major turf diseases. Chipco 26019 is effective on Helminthosporium

operating costs.



Please read label carefully, and use only as directed.

Leaf Spot and Melting Out, Dollar Spot (including benomyl-resistant), Brown Patch, Fusarium Blight, Fusarium Patch (Pink Snow Mold), and Gray Snow Mold.

For healthier turf on greens, tees and fairways — plus a healthy cut in operating costs — control diseases with long-lasting Chipco 26019. It's just what the doctor ordered.

Rhône-Poulenc Chemical Company, Agrochemical Division, Rhône-Poulenc Inc., Monmouth Junction, NJ 08852.

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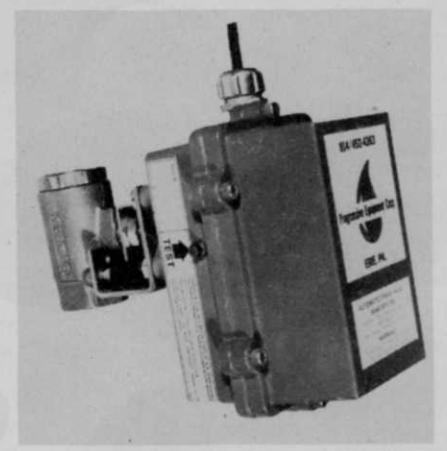
CHIPCO 26019. It's strong medicine.

Circle No. 148 on Reader Inquiry Card

Progressive Equipment Corp.'s automatic motorized drain has an electric valve actuator that can deliver 150 lbs./inch of torque, and can open and close



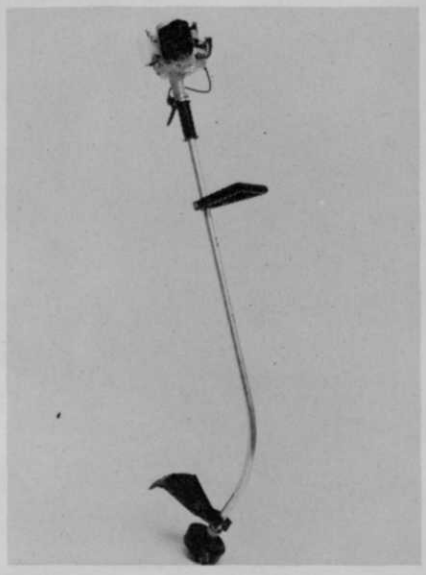
the drain valve on pre-set command. The standard one inch drain valve weighs eleven lbs. and occupies under one-half cubic feet of space.
Circle No. 172 on Reader Inquiry Card

Joseph S. Finger & Assocs., Inc. have developed a portable device for measuring the compaction of seedbed mixtures on greens. According to Finger,

the vibration of equipment used on greens over a period of three to five years may be a greater cause of compaction than foot traffic. The "percolometer" can measure both compression and vibration, and can be used to check greens mixtures in less than two hours.
Circle No. 173 on Reader Inquiry Card

Loveland Industries, Inc.'s Fighter F silicone antifoam emulsion can be used with most aqueous and oil spray systems. The product was created to help reduce mixing time, eliminate material waste, and to provide more accurate metering of agricultural spraying. One to six ounces of Fighter F is used for every 100 gallons of spray mixture.
Circle No. 174 on Reader Inquiry Card

Hoffco Inc.'s lightweight trimmer is powered by a 13.8cc Kioritz engine with a 48-in. patented flexible drive shaft. The GT 14B features a Delta "D"



plastic loop handle and a one line three exit monfilament head. This small model is designed to give a professional performance at an economical price.
Circle No. 175 on Reader Inquiry Card

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America's becoming attached to multimot.

SOLO introduces an impressive array of outdoor equipment powered by a tough, compact 1½ hp SOLO-BUILT two cycle engine. It quickly attaches to a **lawnmower, grass trimmer, brush cutter** or **chain saw.** Also a **hedge trimmer, tiller/cultivator, hand held air blower, centrifugal** or **high pressure liquid pumps** and **sprayers.** And more to come — all SOLO engineered to attach in seconds without tools.

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Circle No. 151 on Reader Inquiry Card

The Campbell Pacific Nuclear Corp. has announced the release of a instrument for measuring soil compaction and moisture. Called the Strataprobe, the device is designed to sort out tillage and trafficking effects on location in

the field without disturbing soil or living products. A new gauge has been designed to increase the accuracy of measurements from lightweight to maximum density.

Circle No. 176 on Reader Inquiry Card

Stanley Hydraulic Tools has introduced its model DL33 drill for use in moling and underground boring operations. Designed for low maintenance,

the tool features a compact gear-type hydraulic motor, a maximum torque of 95 lb-ft., a removable remote trigger, and instant reverse.

Circle No. 177 on Reader Inquiry Card

The General, Inc.'s LB-420, 53 hp, diesel-powered loader backhoe features four-wheel hydrostatic drive, a five-eighths cubic yard loader and a new low profile 11- or 13-foot backhoe.

The new design allows for trailering through low underpasses or work in low-clearance areas unaccessible to previous models.

Circle No. 178 on Reader Inquiry Card

The Hinde Engineering Co. has introduced their Air-Aqua irrigation system designed to allow for the direct irrigation of roots without fear of clogging or deterioration. The semi-rigid valved tubing is placed below ground adjacent to either established or new plants. According to the manufacturer, the valves close automatically when pressure is turned off to block out dirt, roots and insects.

Circle No. 179 on Reader Inquiry Card

Continues on page 86

Trailer aerator/dump box package by Dedoes: easy, quick and effective.

You can be sure they'll work for you. Can be pulled by most tractors including International, Toro, Ford, Massey Ferguson, Yanmar, Kubota, John Deere, E-Z-Go, and Cushman, because Dedoes trailer aerator and dump box attach to your hitch.

Newly designed remote control hydraulics for easy hookup and stable saddlebag weight boxes for proper penetration, are two hard-working features that make your job easier. Not only is it easy to operate, you'll get years of time-saving aeration with low maintenance.

The new trailer aerator is available in a variety of tine styles for tees, greens, fairways, lawns, right-of-ways, or institutional grounds.

So if you're responsible for strong, healthy, attractive grass and concerned with saving time and money, it's worth your time to investigate Dedoes quality aerators. Call today for a demonstration.

Complete package includes hydraulic dump box trailer with 1000 lb. lift capacity which uses same remote control hydraulic motor as aerator. Features double acting tailgate on 48" x 52" x 12" box with heavy duty square steel tube frame.

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Circle No. 113 on Reader Inquiry Card

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GREENSAVER
The Greensaver® aerator gives *precise* aeration over fine turf areas.

SPRAYER
The Sprayer attachment sprays chemicals through an optional 15' rearboom or optional handgun.

FLATBED BOX & SHORT BOX
The Flatbed Box and Short Box attachments haul and dump 1500 pounds of sand or soil, with optional live hydraulics.

Introducing the redesigned Cushman Turf-Trucksters.™

Both sport a sleeker, more sensible body that gives you two headlights, comfortable seating for two, and "clustered" controls conveniently located at the driver's side.

The new Turf-Trucksters have also been treated to such improvements as an optional "live" hydraulics package that speeds up work and prolongs clutch life, and a separate PTO system that has been simplified to reduce wear.

But there's a lot of the old Turf-Trucksters in these vehicles, too. You'll find the same air-cooled 18 hp OMC engine, auxiliary transmission and heavy-duty differential that hundreds of turf pros have come to depend on over the years. Plus, standard features like a 1500 lb. payload, and engine/ground speed governor for precise spreading or spraying.

What really sets the Turf-Trucksters apart though, is the variety of interchangeable Cushman attachments that go on in a snap with the unique pin-disconnect system.

So, you can start with just one Turf-Truckster and build a complete fleet of hard-working machines —that's economy. Plus, if you already own Turf-Truckster attachments, they'll work perfectly with these new models, too.

Fill out and return this coupon today. What you'll get back is a new, full-line catalog of the time-saving, money-saving Cushman system.

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Circle No. 112 on Reader Inquiry Card

CUSHMAN. THE WORKING SYSTEM.

QUICK AERATOR
The Quick Aerator's 46" swath covers wide expanses of turf quickly. Choice of 3 tine styles: coring, slicing, open spoon.

TOP DRESSER
The Top Dresser holds about 1000 pounds of material and spreads a 31½" swath precisely and evenly.

SPREADER/SEEDER
The Spreader/Seeder provides uniform spreading across a wide 40" swath.

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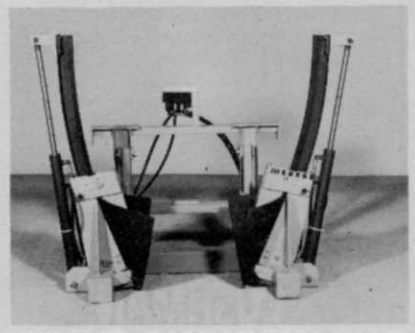
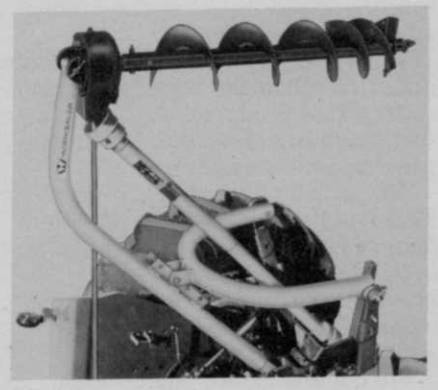
Rokor, Inc., has expanded its digger line to include the Rokor 20, which produces an actual ball size of 22 inches in diameter, with a 24-in. model also available. It incorporates design features used in Rokor's larger models, such as curved stems and narrow width, but it can be installed on smaller skid steer loaders, tractors, and front-end loaders.



Circle No. 180 on Reader Inquiry Card

Worksaver, Inc. has introduced a post hole digger with a four-position boom to allow for adaptation to most 3-point tractors. The screw-type auger center point and teeth are replaceable, and available in 6-in., 9-in. or 12-in. lengths.



The unit's gear box features roller bearings with double lip spring-loaded seals designed for smooth operation.

Circle No. 181 on Reader Inquiry Card

Glenmac Inc.'s Harley Stone Removal equipment is designed for optimum results when fine cleaning trash and rocks for seed bed preparation on new golf courses. According to the manufacturer, the equipment will sanitize down to ½-in. and can clear from 5-15 acres per day. Glenmac offers the rock picker for sale or will contract for site preparation.

Circle No. 182 on Reader Inquiry Card

A new high rpm brush blade from Hoffco, Inc. is available as an accessory item for their JP340 and JP215 model grass trimmers. The Sandvik Brush Blade, of heavy spring steel, measures 9-in. in diameter with a 20 mm bore.

The blade has 22 cutting teeth, each equipped with a forward depth gauge designed to keep kickback at a minimum.

Circle No. 183 on Reader Inquiry Card

Continues on page 93

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Saves Time, Labor and Fuel.

- Maneuverability with "feather touch" control puts you in full command.
- Dual hydrostatic power provides "one pass" mowing eliminating finish trim time.
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- PTO drive to mower deck eliminates belts, simplifies change of accessories.
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- Dozer Blade • Sweeper • Snowthrower

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Body Fashions/Intimate Apparel	8,984
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Dental Management	101,645
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Electronic Technician/Dealer	43,041
Fast Service	50,378
Flooring	13,032
Food Management	49,723
Hearing Instruments	17,002
Home & Auto	22,424
Hotel & Motel Management	36,360
Housewares	12,678
Industrial Education	45,096

Magazine	Circulation
LP/Gas	13,664
Lawn Care Industry	12,178
Neurology	12,600
Paper Sales	12,061
Pest Control	14,624
Professional Remodeling	36,076
Quick Frozen Foods	20,721
Rent All	11,136
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Toys Hobbies & Crafts	14,196
Weeds Trees & Turf	42,375

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A

EVENTS

The current issue of WEEDS TREES & TURF carries meeting dates beginning with the following month. To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 757 Third Ave., New York, NY 10017.

Iowa Turfgrass Conference and Trade Show, Marriott Hotel, Des Moines, IA, **March 1-3.** Contact Ed Cott, 105 Horticulture Building, Iowa State University, Ames, IA 50011, 515/294-1870.

Pennsylvania Turfgrass Conference and Trade Show, Hershey Lodge and Convention Center, Hershey, PA, **March 1-4.** Contact Christine King, Pennsylvania Turfgrass Council, 412 Blanchard Street, Bellefonte, PA 16823.

Midwest Regional Turf Conference, Purdue University, West Lafayette, IN, **March 1-3.** Contact W.H. Daniel, Purdue University, Dept. of Agronomy, West Lafayette, IN 47907, 317/494-4785.

51st Massachusetts Turfgrass Conference and Sixth Industrial Show, Civic Center, Springfield, MA, **March 2-4.** Contact Dr. Joseph Troll, Stockbridge Hall Room 12, University of Massachusetts, Amherst, MA 01003-0099, 413/545-2353.

American Sod Producers Association Midwinter Conference, Royal Lahaina, Maui, HI, **March 3-5.** Contact Bob Garey, Association Building, Ninth and Minnesota, Hastings, NE 68901, 402/463-4683.

Canadian Turfgrass Conference and Show, Constellation Hotel, Toronto, Ontario Canada, **March 7-10.** Contact Mary Gurney, 698 Weston Road, Toronto, Ontario M6N 3R3, 416/767-0387.

"Interiorscape Design—A Total Approach," Airport Hilton, Salt Lake City, UT, **March 12.** Contact Scott Wolford, Utah Chapter/ASLA, 57 W. So. Temple #300, Salt Lake City, UT 84101, 801/364-1718.

International Society of Arboriculture 33rd Annual Convention, Valhalla Inn, Toronto, Ontario Canada, **March 16-19.** Contact ISA/Canada, P.O. Box 995, Station B, Willowdale, Ontario Canada M2K 2T6.

Maine Turf Conference, Merry Manor Inn, South Portland, ME, **March 17-18.** Contact Vaughn Holyoke, Deering Hall, University of Maine, Orono, ME 04469, 207/581-2111.

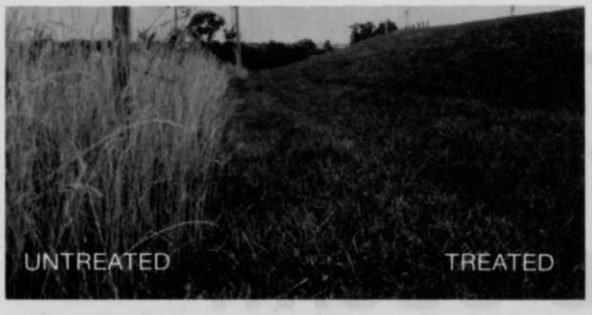
Tree Care—Urban Forestry Foreman Training, Davey Environmental Services, Kent, OH, **March 22-April 2.** Contact Richard Abbott, Davey Environmental Services, 117 South Water Street, Kent, OH 44240, 1-800/321-7572.

Soil Erosion and Sedementation Control Short Course, Vance Tyee Motor Inn, Olympia, WA, **March 23-24.** Contact Roy Goss, Western Washington Research and Extension Center, Puyallup, WA 98371, 206/593-8513.

EMBARK® Plant Growth Regulator [PGR]

WHAT

A solution to suppress turf growth for up to 8 weeks.



EMBARK PGR can significantly reduce or even eliminate mowing requirements for 5 weeks on bermudagrass, and up to 8 weeks on grasses such as Kentucky and annual bluegrass, fescues, perennial ryegrass, quackgrass and many others.

Unsightly seedheads will also be suppressed or eliminated.

WHERE

A work-saver on low-maintenance grasses, hard-to-mow and trim areas.

Put EMBARK PGR to work along highways, around industrial parks, at cemeteries and wherever else you want a uniform appearance of grass with less mowing.

Also reduce mowing hazard and time on slopes, around headstones and other hard-to-mow areas. Grass remains viable and green.

USDA's Insect Identification and Beneficial Insect Introduction Institute in Beltsville, where nearly one-third of a million insects and mites are identified each year for biological control projects and other research.

Knutson said that despite successes already achieved, progress in putting IPM to work has seemed slow at times. "Much of the foundation work, the research on natural enemies, has not yet reached the farm. Each biological control agent requires considerable study because of the complex behavior and ecology of living entities. We first must determine the vulnerabilities of a pest. Then, each new biocontrol agent requires a unique set of in-the-field procedures." Knutson added that using IPM on the farm, often takes a lot of time, special knowledge and a high initial risk financially.

HORTICULTURE

Record number contribute to HRI

The Horticultural Research Institute (HRI) has increased its industry support by 101 firms in the past ten years,

Continues on page 90

Instructor Fred Buscher (right) critiques a drawing during a three-day short course on residential landscape design. Jerry Magistrella (left) and Rose Spena were two of the 56 members of the nursery and landscape industry at the course who received instruction on landscape plan drawing and design. Buscher, area extension agent in landscape horticulture, established the series of five three-day Short Courses in 1976 in cooperation with the Ohio State University Department of Landscape Architecture.

Keeps turf as trim as the budget... easily.

WHY

One mowing instead of eight saves time, labor and budget

With EMBARK PGR, mow once instead of 8 times. You could start saving after you eliminate the second mowing. Also frees up the crew to get more jobs done with the same people in the same time.

If you'd like to calculate your specific mowing costs and potential savings...

Ask for your free guide

HOW

Applies easily with standard spray equipment

Apply anytime turf is actively growing. Use a range of spray equipment from truck mounted booms to a backpack unit.

Product Application Handbook is available from your distributor. Anyone on the job can also call toll-free for answers on equipment calibration.

For your free Mowing Costs Guide and toll-free call card contact your dealer or Agricultural Products/3M, 223-6SE, St. Paul, MN 55144.

EMBARK is a reg. TM of 3M.

3M Hears You.

3M

Circle No. 156 on Reader Inquiry Card

NEWS *from page 89*

A Cushman Frontline mower is donated to Dr. Bob Shearman, University of Nebraska, (seated) by Herb Jesperson, OMC Lincoln. This unit is part of the ongoing support by the Lincoln-based manufacturer for the school's various turf projects. Dr. Shearman will use the self-propelled mower on turf research plots located near Mead, NB.

according to Administrator Duane Jelinek.

At the American Association of Nurserymen board of governors meeting in 1981, HRI Past President Bob Siebenthaler recalled the progress the Institute has made in the past ten years. "... in 1971, 143 business firms contributed their support to HRI," said Siebenthaler. "Today it's 244. Likewise, state, regional and national nurserymen's association support has also increased. In 1971, 28 associations contributed to HRI. In 1980, 35 associations contributed." Siebenthaler added that while HRI still has not received the support from the industry it truly deserves, it is making good progress.

ORNAMENTALS

Penncap-M granted SLN in Ohio

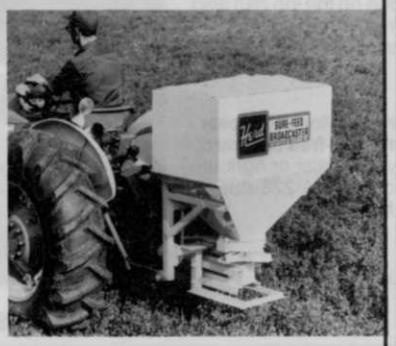
Ohio has granted the AgChem division of Pennwalt Corp., Philadelphia, PA, a Special Local Needs (SLN) registration for use of Penncap-M insecticide to control leafminers on chrysanthemums grown in commercial greenhouses.

The SLN registration allows Penn-

GT-77 for Garden Tractors, A.T.V.s and A.T.C.s

MODEL GT-77
77 LBS. CAPACITY

MODEL 750
9.6 BU. CAPACITY



Herd

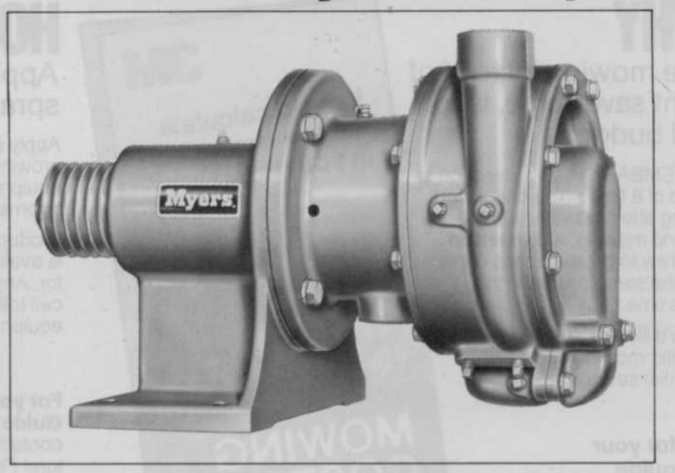
has seeders for all your needs. Seven different models ... means a size to fit your job.

WRITE FOR COLOR CATALOG

HERD SEEDER CO., INC., DEPT. 260
P.O. BOX 448, LOGANSPORT, INDIANA 46947

Circle No. 122 on Reader Inquiry Card

Deep within the heart of every Myers Sprayer beats a Myers Pump.



This Myers pump is the key to Myers sprayer performance. Ruggedly built to withstand demanding field conditions, Myers No. 2C95 two-stage centrifugal pump delivers 100 GPM/200 PSI . . . and, the performance doesn't drop off as pressure goes up! Unique Myers design features enable this pump to operate smoothly, with great dependability and long trouble-free service life.

Versatile, new 500 gallon fiberglass tank sprayers. Offered with choice (25 GPM/800 PSI, 10 GPM/500 PSI or 95 GPM/200 PSI) of Myers heavy duty spray pumps. Power options include 23 HP or 7 HP gasoline engines or PTO drive. Trailer type running gear, hose reel, boom piping, hose, high pressure guns, plus many other accessories are also available.

F. E. MYERS CO. DIVISION OF McNEIL CORPORATION

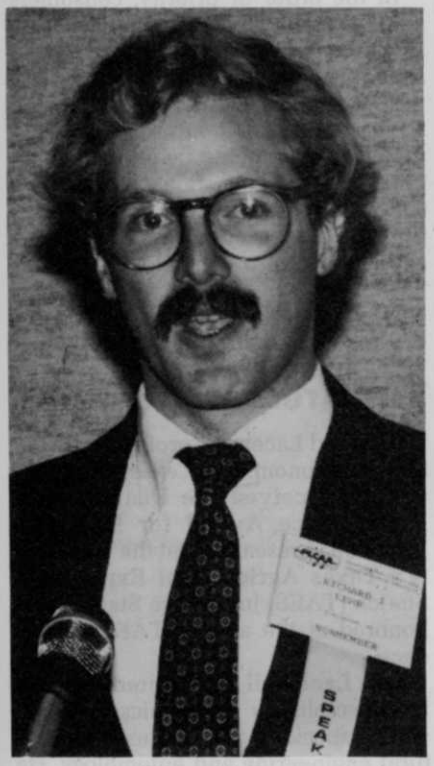
Circle No. 138 on Reader Inquiry Card

cap-M to be used at the rate of 2 pints per 100 gallons of water as a full coverage spray on foliage. Penncap-M is an insecticide which features a controlled release of methyl parathion, according to Pennwalt.

LAWN CARE

PLCAA names Lehr Honorary Member

Labor lawyer Richard Lehr has been conferred an Honorary Membership by the Professional Lawn Care Association of America. Lehr received his membership at the PLCAA convention, where he was a guest speaker. Lehr's presentation was on "Lawn Care Employer Hot Spots: Wrongful Discharge and Proper Compensation of Employees."



Richard Lehr

As a labor lawyer, Lehr has presented a number of employer seminars throughout the Sunbelt concerning union prevention techniques, equal employment requirements and wage/hour issues, and has authored articles on labor matters both nationally and internationally. He is the author of the monthly column "Lehr on Labor Law" published in *Lawn Care Industry* and has counseled numerous employers with regard to labor, wage and hour matters. Lehr will also serve as a contributing editor of PLCAA's newsletter, *Turf Talks*.

Lehr is a management labor lawyer with Sirote, Permutt, Friend, Friedman, Held and Apolinsky, in Birmingham, AL.

ChemLawn names Luke executive vp and COO

In a move to strengthen its management capability, ChemLawn Corp., Columbus, OH, has appointed Don Luke to the newly created position of executive vice president and chief operating officer. A former vice president with Parker Pen Co., R.J. Reynolds and Quaker Oats, Luke will oversee all operations and new business development. The company has also named William Kaufmann vice president of human resources.

ChemLawn recently financed the acquisition of a 40-acre site and construction of a $6 million corporate center. Approximately 250 employees will be located at the new headquarters, set for completion in June 1982.

Continues on page 92

MILORGANITE

The natural organic fertilizer... Use in any season... Ideal for Lawns, Parks, Cemeteries and Athletic Fields

A DISTINCTIVE PRODUCT...Milorganite is a NATURAL ALL-ORGANIC fertilizer. It is easy to apply, without danger of burning, and watering-in is never necessary. Milorganite never deteriorates or hardens during storage. Milorganite contains natural organic nitrogen, phosphorus, iron and all secondary and minor elements needed by grass. All are released gradually and surely to insure uniform color and growth.

THE IDEAL PARK, CEMETERY AND HOME LAWN FOOD...It is easy to have a luxuriant turf. Follow the method used by leading golf courses everywhere. Grass is a VORACIOUS FEEDER and ample, slowly-released plant food encourages existing grass to spread and produce dense turf. Instead of reseeding constantly, the best golf courses

FERTILIZE REGULARLY EACH YEAR —with MILORGANITE.

Milorganite cannot burn the turf since it is not salty and *Milorganized* turf requires less water than other fertilizers.

MIX GRASS SEED WITH MILORGANITE ...The best way to insure even distribution of seed on new turf areas and when reseeding a poor lawn. Milorganite gets the young grass off to a fast start and hastens establishment of a dense, uniform grass cover. Milorganite is also ideal for trees, shrubs, and flowers.

MILORGANITE'S TRUE VALUE PROVED BY ANALYSIS AND RESPONSE! Milorganite is the greatest bargain in fertilizer today. It is loaded with dollar value materials completely lacking in other fertilizers sold for turf and ornamentals.

THE MARGIN OF SAFETY

Milorganite does not burn and is almost impossible to over-apply.

DO NOT USE ON EDIBLE CROPS

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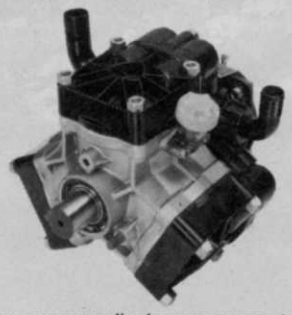
735 N. WATER ST., MILWAUKEE, WI 53202

Circle No. 133 on Reader Inquiry Card

NEW! DIAPHRAGM PUMPS FROM HYPRO.

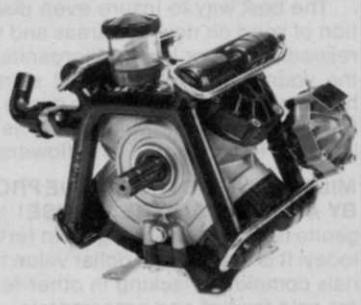
Announcing a complete line of low cost, low maintenance diaphragm pumps and accessories. These new pumps feature proven designs, high quality engineering and the reliability you expect from Hypro.

Outputs range from 5 to 60 gpm. Pressures from 250 to 850 psi. Pumps are extremely durable and easy to repair. Diaphragm pump applications range from spraying to pressure washing to liquid transfer to hydrostatic testing. And a full range of accessories plus nationwide Hypro service is available. Get the facts on new diaphragm pumps from Hypro today.



Low pressure diaphragm pumps, to 280 psi, with outputs to 60 gpm.

Medium pressure diaphragm pumps, to 580 psi, with outputs to 13 gpm.



High pressure diaphragm pumps, to 850 psi, with outputs to 50 gpm.

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Circle No. 126 on Reader Inquiry Card

EXTENSION

Maryland to charge for soil testing

The Maryland Cooperative Extension Service has announced that it will start charging for its laboratory analyses of soil samples. Effective February 15 the cost will be $4 per sample.

Dr. V. Allan Bandel, extension soils specialist in charge of the soil testing program, says that charging for soil sample testing will permit hiring additional laboratory help. A larger staff will provide more efficient service in the face of a workload which has more than doubled since 1964. Unfortunately, budget allocations have not kept pace with the increased workload, Bandel commented.

Traditionally, the university's free soil testing service for Maryland residents involved analyses for soil texture, pH, phosphorus, potassium and magnesium. Nominal charges were made for certain special tests; e.g., analyses for boron, manganese, zinc, soluble salts and organic matter content.

Written recommendations for fertilizer and lime application, based on soil test results, will continue to be provided by county extension workers. This customized service is based in part on cropping history and future plans contained on the information sheet which is submitted with each soil sample.

TURFGRASS

Ham Williams, educator, dies

Dr. H. Hamilton Williams, renowned turfgrass educator and scientist, died recently in Los Angeles. He was 70 years old.

Williams was best known for his work as a biologist in turfgrass research and education at the Los Angeles State and County Arboretum, Arcadia, CA. He received a respected reputation for his research at the Arboretum and taught classes in turfgrass management.

Williams was the first black man to be awarded a Ph.D. in ornamental horticulture at Cornell University. He was then appointed chairman of botany and horticulture at A and T College in Greensboro, NC. After serving in various educational positions, Williams joined the United States Planning Office as a consultant for a landscape design project in Liberia, Africa. After completing the project he joined the Los Angeles Housing Authority and then the Arboretum.

As a member and officer, Williams was very active in the Southern California Turfgrass Council, Athletic and Recreational Turfgrass Association and International Turfgrass Society.

RESEARCH

Nursery customers desire information

Research conducted by the Nursery Marketing council reveals that customers who spend the most time on their landscape want information. Price is important to them, but more often than not they will shop at a retail nursery where they believe they can receive good advice from competent people.

In the order of priority, consumers say they want to know about soil conditions, growing needs (sun, water, shade), types of plants for the area, pest/weed control, and when to plant. At least one person informed on technical subjects should be on hand at all times to answer questions, the research concluded. Information racks and a public address system for questions and answers also will help.

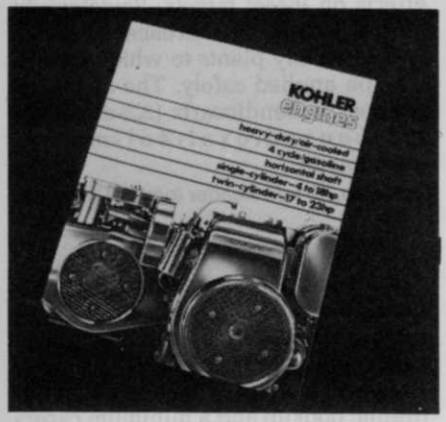
Lacewell receives TAES research award

Dr. Ronald Lacewell, professor of agricultural economics at Texas A&M University, received the Distinguished Performance Award for Research. Lacewell, a researcher at the University's Texas Agricultural Experiment Station (TAES) in College Station, was honored at the annual TAES conference.

Dr. Lacewell was cited for his interdisciplinary economics research work, especially as it relates to agricultural engineering and entomology. He has played a major role in researching economic problems relating to the development and use of the state's natural resources, particularly such pressing issues as water development and use, land conservation and management, environmental protection and pest control, and energy. His practical approach to economics has provided the basis for many policy and producer decisions on the adoption of new technology and expected benefits. **WTT**

COMING NEXT MONTH: COTONEASTER

The Kohler Co. has released a four-page full-color folder giving specifications for all 13 Kohler manufacturing



air-cooled engines. The product line includes single-cylinder and twin-cylinder engines ranging from four to 23 hp, and from 43 to 187 lbs.

Circle No. 184 on Reader Inquiry Card

Ditch Witch has introduced its Model 1410 handlebar trencher with a 12- to 14-hp-class engine. The 35½-in. wide machine can dig trenches up to five feet. Features include a hydraulically

raised and lowered digging boom, a 140 degree digging boom travel angle, and single-range hydrostatic ground drive.

Circle No. 185 on Reader Inquiry Card

Advanced Drainage Systems, Inc. has developed two forms of synthetic wrapping to be used with ADS corrugated plastic tubing of up to 15 inches in diameter. The non-biodegradable drain envelopes provide a screen to stabilize soil and keep water flowing. Drain Guard can be used as a screen for normal installations, and the Sock is available for more rough-and-tumble jobs.

Circle No. 186 on Reader Inquiry Card

Turfcart by Cushman is a new heavy duty personnel and tool transport that can attain speeds of up to 14 mph. With the passenger seat tilted up to form a backrest, the vehicle becomes a rugged carry-all for tools. Turfcart is equipped with lights for night use and is designed for a payload of up to 250 lbs.

Circle No. 187 on Reader Inquiry Card

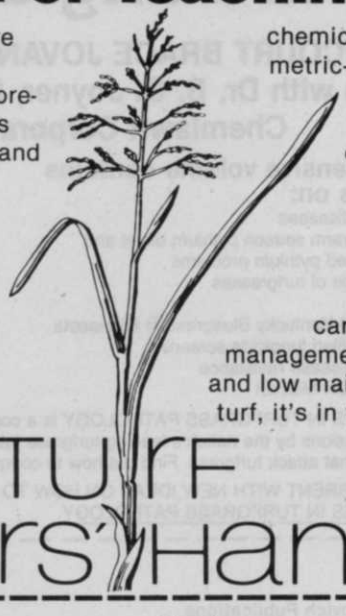
Proxel 80 SP insecticide from Tuco is designed for the control of white grubs and surface feeders in fine turf areas. It can be used with standard spray equipment and combined with other non-alkaline chemicals to save time. Appli-

Continues on page 94

Finally, An Aid For Teaching Turfgrass

Superintendents, Contractors, Lawn Care Managers, New, On-the-Job Reference. The Turf Managers' Handbook is a comprehensive, organized approach to turfgrass science and care. It has been designed and written by leading turf specialists from Purdue, Dr. William Daniel and Dr. Ray Freeborg, for on-the-job reference and as a text for students.

The book contains 150 illustrations and 96 color photographs. Data includes 240 tables and forms. Included are specifications for rootzones, employment, calculations for chemical applications, and extensive metric-imperial conversion. Business and technical aspects of turfgrass management are covered in this 424-page book. Planning, purchasing, hiring, construction, and plant selection are put together for easy on-the-job reference. Markets covered include lawn care, sod production, golf course management, cemeteries, athletic fields, and low maintenance areas. If it concerns turf, it's in the Turf Managers' Handbook.



TURF managers' HANDBOOK

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*Please add $3.00 per order plus $1.00 per additional copy for postage and handling.

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Duluth, MN 55802

HBJ

WTT 32

cation should be at the rate of 10 lbs. per acre and should be followed by thorough irrigation of the treated turf.
Circle No. 188 on Reader Inquiry Card

Richway Industries Ltd. has introduced its TF-4 Foam Marking System. Designed for reduced maintenance

over their previous model, the new system was developed to ensure a simple and efficient method of operation.
Circle No. 189 on Reader Inquiry Card

Warren's Turf Nursery, Inc., has introduced its model T-7 Multi-Purpose Spreader designed for fast and accurate dispersal of seeds and chemicals. The compact, lightweight T-7 can be

adjusted for a spreading range of up to 20 feet. As the crank is being rotated, a constant, even flow is assured because of a continuously moving interior agitator.
Circle No. 190 on Reader Inquiry Card

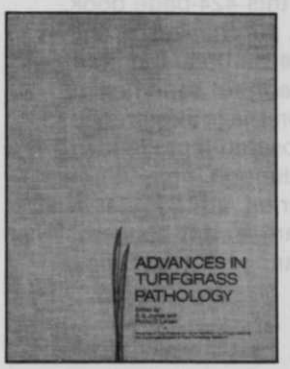
Turf Seed, Inc. has introduced the new Manhattan II ryegrass developed by Dr. W.A. Meyer and the New Jersey Agriculture Experiment Station. The dark green grass was developed to have a fine leaf texture, high shoot density, reduced leaf extension rate, and good heat and cold tolerance.

Mallinckrodt, Inc.'s Dycarb is intended as a broad spectrum insecticide with both contact and stomach poison effects on insect targets. Phytotoxicity testing located 58 herbaceous plants and 43 woody plants to which Dycarb may be applied safely. The active ingredient is Bendiocarb: (2,2-dimethyl-1,3-benzodioxol-4ol-methyl-carbamate).
Circle No. 191 on Reader Inquiry Card

The Vermeer Manufacturing Co. has developed a 910-lb. tree spade mechanism engineered as a digging and packaging attachment for skid steer or front-end loaders with an auxiliary hydraulic hookup and a minimum capacity of 1,200 lbs. The Vermeer TS-24

Advances in Turfgrass Pathology

published by HARCOURT BRACE JOVANOVICH PUBLICATIONS in cooperation with Dr. B. G. Joyner, Dr. P. O. Larsen and Chemlawn Corporation



This extensive volume contains chapters on:

- turfgrass diseases
- cool v.s. warm season pythium blight and other related pythium problems
- snow molds of turfgrasses
- fairy rings
- leaf spot of Kentucky Bluegrass in Minnesota
- initial and filed fungicide screening
- turfgrass disease resistance
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Tree Spade is operated by a remote control system intended to eliminate cumbersome hose and valve attachments.

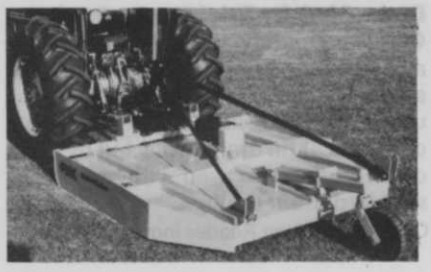
Circle No. 193 on Reader Inquiry Card

Echo, Inc. has added a new vacuum attachment to accommodate their models PB-9, PB-400 and DM-9 power blowers and duster misters. The PBAV-400 op-

erates on a venturi pump principle, with a lever creating suction air volume through the blower discharge pipe into the attachment's bag. Two or three bushel bags are available.

Circle No. 194 on Reader Inquiry Card

FMC Corp./Agricultural Machinery division has introduced its Side-Winder GB-700 heavy duty, single spindle rotary cutter. It features an 84-in. cutting swath, adjustable cutting height (from 2 to 10 inches) and will fit either a Category 11 or 111 standard or quick hitch. It can be purchased with hardware which includes a single ad-



justable, full swivel tail wheel and stabilizer arms for mounting to three-point hitch so that the unit has lift capability; or with hard ware which includes a dual tail wheel assembly, offset brackets for semi-mounting and a dual angle PTO assembly so the unit can be used in an offset mode.

Circle No. 195 on Reader Inquiry Card

Melex USA Inc.'s Turtle 212 is a four-wheel golf cart featuring self-adjusting rear wheel brakes with precision machined drums and a redesigned front

end. The vehicle also includes an automatic seat brake, sweater basket, mud guards and rear fender spike guards as standard equipment.

Circle No. 196 on Reader Inquiry Card

Two mulching mowers have been added to FMC Corp.'s 1982 Bolens line of lawn and garden equipment. Model 8622 features a 20-in. push mower including inset wheels for close trim-

Continues on page 96

Pump 42,000 GPH with Moulton's Torrential.

Since 1948

The ideal golf course pump for low spots that flood early — ditches — water hazards — and other problem areas. This TORRENTIAL unit is self-powered, self-priming, floating and portable. Will handle any object that will pass through a one-inch screen opening.

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Circle No. 137 on Reader Inquiry Card

SPRAY HOSE WON'T FIGHT BACK WHEN IT'S ON A HANNAY REEL

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- Greater range. Better control.
- Neat, convenient hose storage.
- Less wear and tear on you and the hose.

Specify Hannay Reels for all your spraying operations. Write for your FREE Specification Catalog today.

HANNAY REELS

CLIFFORD B. HANNAY & SON, INC., WESTERLO, NY 12193

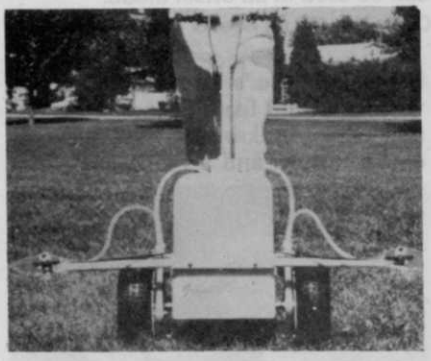
Circle No. 120 on Reader Inquiry Card

ming, adjustable and folding handles and a 3½ hp engine. The self-propelled, model 8642 is a four hp, 22-in. steel deck machine.
Circle No. 197 on Reader Inquiry Card

Alternative Energy Systems is manufacturing woodchip heating furnaces for small businesses with high heating costs, such as nurseries. The thermostat signals an automatic conveyor to feed woodchips from the storage bin to the firebox as required. High temperature burns off all creosote.
Circle No. 198 on Reader Inquiry Card

Drain-Chek by Brighton By-Products Co., is a groundwater drainage system available for use on slopes, basement areas and agriculture or general field use. The prefabricated system consists of a vertical fin drain protected by filter cloth, and can be used with or without standard drain tubing.
Circle No. 199 on Reader Inquiry Card

Wheel Spray Corp.'s Grounds Wheelie is used to apply liquid fertilizers, fungicides, herbicides, insecticides and growth regulators. The unit is powered by walking—no water hoses, cords, batteries or gasoline are required. The WS-480 is equipped with two pumps, two nozzles, two foldup booms and shut-off controls located on the handle grips.
Circle No. 200 on Reader Inquiry Card



Aquatrols Corp.'s Aqua-Gro is designed for conservation by improving the spreading and wetting action of plain water. This blended, nonionic

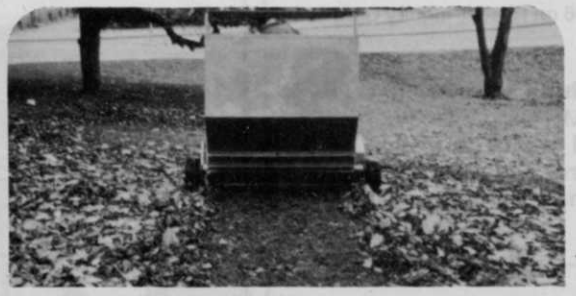
agent works by penetrating the soil and moistening the rootzone profile. Aqua-Gro is available in spreadable or liquid concentrate form.
Circle No. 201 on Reader Inquiry Card

Ford Tractor dealers are set to introduce two new low-profile lawn tractors. The eight-horsepower model LT 81 and the 11-horsepower LT111 replace the current Ford LT 80 and LT 110. The new models are equipped with a dual-speed transmission, allowing six forward speeds and one reverse speed to

double the LT's current selection of forward ground speeds. The LT's cowl and rear fender are restyled and redesigned with rust-resisting plastics. The units also feature a flip-up hood for easy access to the engine compartment. A 34-in. mower deck is standard on the LT81. The LT 111 features an optional 42-in. deck.
Circle No. 202 on Reader Inquiry Card

Jacobsen Turf Products has introduced a hydraulically driven vertical reel mower that interchanges with hydraulic drive fairway gang units to re-

M-C MATHEWS COMPANY
Lawn Genie
pick-up mower



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- Spring - Thatches, renovates and picks up in one pass
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Change mowing or thatching blades in seconds with M-C's patented hanger design.

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P. O. Box 70
Crystal Lake, IL 60014
815/459-2210
Iron Horse Quality Equipment
Circle No. 132 on Reader Inquiry Card

move and control thatch, reduce compaction and aerate soil. Another Jacobsen product is the Greens King IV riding reel mower which features hydraulic backlapping with reels in place.
Circle No. 203 on Reader Inquiry Card

Custom Products has introduced a new type of Cozy Cab for the John Deere 650 compact utility tractor. The new Custom 200 is the first Cozy Cab with a removable vinyl enclosure. The enclosure, consisting of wire frame vi-

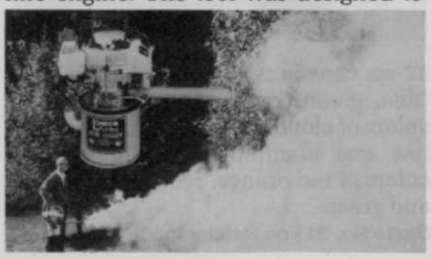
nyl doors and vinyl sides and back, wraps around a four-post ROPS structure with a steel roof to form a weathertight cab. Heavy duty Velcro fasteners hold the enclosure securely in place, yet permit removal for warm weather work.
Circle No. 204 on Reader Inquiry Card

Vermeer Manufacturing Co.'s V-430 is a compact, 30 hp, rigid frame utility tractor equipped with 4-wheel drive, power steering and 3-speed mechani-

cal drive. The 2861 lb. trencher digs 5-16-in. wide, and down to 60-in. deep. Its features include a heavy-duty crumber, a digging chain with a tensile strength of 43,000 lbs. and a large diameter end idler.
Circle No. 205 on Reader Inquiry Card

Midmark Corp. has introduced a compact, 7.5 hp walk-behind trencher with a variable digging speed for different soil conditions. Its 20,000 lb. digging chain is designed to trench as deep as 30-in. and as wide as 6-in. Other features of the Midmark 108 include hydrostatic propulsion.
Circle No. 206 on Reader Inquiry Card

London Fog Co.'s portable hand fogger is a 24 lb. unit powered by a gasoline engine. The tool was designed to



create a dense fog of insecticidal solution capable of filling an acre's worth of mosquitoes, gnats, and other flying insects in three to four minutes.
Circle No. 207 on Reader Inquiry Card

Fox Valley Marking Systems' Easy Marker Handle has been redesigned for increased control, comfort and rugged. It has a protective steel hood over the spray tip and the working mechanism is contained within a heavy gauge

steel housing. According to the manufacturer. Easy Marker Handle is perfect for laying out golf courses, grounds for repair, newly seeded areas, traffic control, coding landscape plant material and locations for installation.
Circle No. 208 on Reader Inquiry Card

Continues on page 98

TeeJet

NEW SPRAY NOZZLES and ACCESSORIES From SPRAYING SYSTEMS CO.

NEW— *QuickJet*™ Nozzle Assemblies
A unique new system of quickly interchangeable self-aligning spray nozzles and spray tips. To provide choice of spray droplet size, in full cone, hollow cone and flat spray patterns. ¾" NPT (M) inlet conn. Write for Bulletin 195.

NEW— Model 146 *DirectoValve*®
For remote "on-off" control of spray nozzles and booms from operator's location. Operates on 12 VDC system. Pressure range from 0 to 65 psi. 1¼" NPT (F) spray line connection. Write for Data Sheet 16108.

NEW— Model 244 Electrical Regulating Valve
For remote pressure control in agricultural spray applications. ¾" NPT (F) inlet and outlet conn. Operates on a 12 VDC system. Pressures to 100 psi. Write for Data Sheet 16994.

NEW— ¾" and 1" Nylon Liquid Strainers
Strainer head and bowl made of reinforced Nylon material for pressures to 75 psi. Threaded bowl can be easily unscrewed by hand. Write for Data Sheet 15353.

SPRAYING SYSTEMS CO.
North Ave. at Schmale Rd., Wheaton, IL 60187
Telephone: 312 665-5000 / Telex No. 72-8409

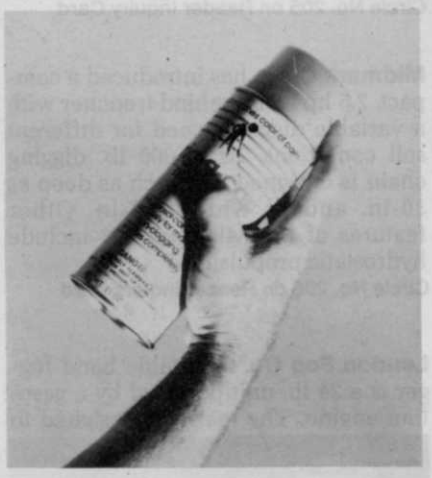
Circle No. 152 on Reader Inquiry Card

The 1982 Cushman Runabout Model 531 features a redesigned frame, twin headlights and an improved suspension system. The two-person, three-

wheel turf care vehicle also includes a new centrifugal clutch, a 1500-lb. payload capacity, and an 18 hp engine. A more economical, 12 hp, one person Runabout is also available.
Circle No. 209 on Reader Inquiry Card

Loveland Industries, Inc.'s Tank and Equipment Cleaner was designed to work as both a neutralizer and a stain remover. It can be used on the inside of tanks, hoses, lines and nozzles to help remove residues left from acid-based pesticides, other herbicides and fertilizer. Available in one lb. re-sealable bottles, 12 per carton.
Circle No. 210 on Reader Inquiry Card

Fox Valley Marking Systems has introduced a brand new formula Trig-A-Cap paint in the original upside down can. The pigment is designed to be brighter, easier to see and make longer lasting marks. The paint is available in



12-oz. cans in APWA colors of yellow, blue, green, red and orange; regular colors of cloud white, electric blue, yellow and aluminum; and fluorescent colors of red orange, red cerise, orange and green.
Circle No. 211 on Reader Inquiry Card

Kawasaki's new two-cycle, 4.3 hp motor for use on heavy duty commercial mower and machines includes a CDI electronic system, a cast iron cylinder wall and a gas/oil mix of 25:1.
Circle No. 212 on Reader Inquiry Card

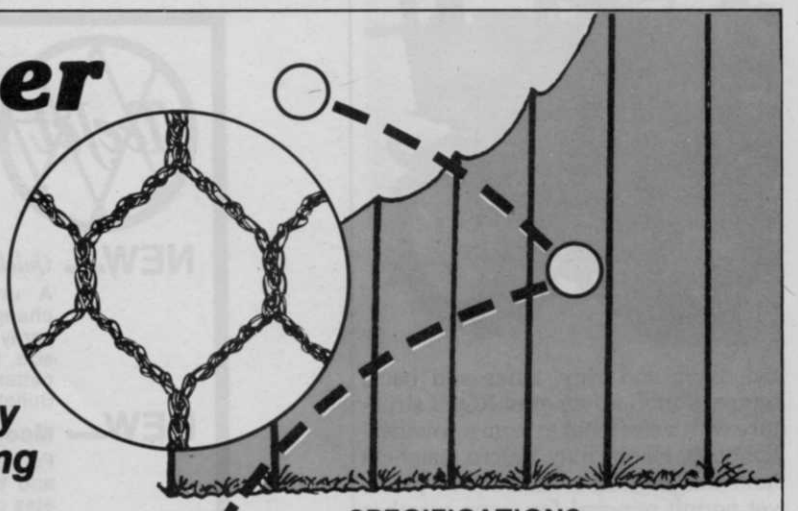
American Enka Co.'s Enkamat is a flexible soil-reinforcement webbing made from nylon monofilaments fused at their intersections. Its three-dimensional structure is a bulky mat of open construction, leaving 90% of its volume as open space which allows grass roots to grow into and through it. According to the manufacturer, Enkamat is environmentally safe, unaffected by

Continues on page 101

Ball Barrier Netting

New, easily installed, inexpensive way to stop "off course" balls.

Produced by the company that makes superior netting for tennis and industry.



- Fast installation—3 times faster than wire.
- Wide widths—eliminate 75% of joining pieces.
- No rust or mildew—made of olefin fibers.
- Light weight—easy to handle.
- Strong, tough—and priced right!
- Saves time—labor—money!

SPECIFICATIONS

Material:	Olefin Fibers
Mesh size:	1"
Strength per mesh:	60 lbs.
Bursting strength per mesh:	220 lbs.
Durability:	5 to 10 years
Resistance:	Will not rot or mildew

ACCESSORIES

3/16" airplane cable, 3700 lbs. breaking strength.
Eye to eye turnbuckles and cable clips.
Hog ring pliers and hog rings.
"S" hooks.

JAC **J.A.CISSEL** CO. INC.

Squankum-Yellowbrook Road, Farmingdale, New Jersey 07727, (201) 938-6600

OUTSIDE NEW JERSEY, CALL TOLL FREE (800) 631-2234

Circle No. 110 on Reader Inquiry Card

humic acids and soil fungi, and its aerifying effect reduces turf compaction while promoting the growth of each individual grass plant.
Circle No. 213 on Reader Inquiry Card

The G-20 turf and general utility tractor from Jacobsen Turf Products features a broad power range, hydrostatic steering and diesel power. For

hauling equipment and supplies, Jacobsen has recently added the model 80 Trailer to its turf and grounds maintenance line.
Circle No. 214 on Reader Inquiry Card

J.A. Cissel now offers Ball Barrier netting specially designed for golf courses and practice ranges. It is lightweight,

according to the company. Cissel Ball Barrier is made in 6½- and 25-ft. widths.
Circle No. 215 on Reader Inquiry Card

Olympic Tall Fescue from Turf-Seed, Inc. is a turf-type fescue with a genetic background allowing for low fertilizer and water requirements. It has a dark green color and medium leaf texture, and was developed for good summer and low temperature color retention, good spring green up and good winter hardiness.
Circle No. 216 on Reader Inquiry Card

Continues on page 103

Weather-matic Works

and works a[illegible] works
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day af[illegible] ay
week[illegible] ner
month[illegible] nth
year aft[illegible] year

Automatic landscape irrigation systems from Weather-matic are engineered and tested — and proved — to give years of trouble-free service. Costly callbacks for repairs and service seldom bother Weather-matic owners. And with the industry's finest selection of sprinkler heads and its most dependable valves and controllers, you can be sure to put exactly the right volume of water precisely where you want it, when you need it, without waste.

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Circle No. 161 on Reader Inquiry Card

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There's a lot of grass to mow in the Windy City, and Chicago's Park District uses rugged Woods mowers to help them cover a lot of ground.

But Woods mowers aren't designed just for large areas. In fact, we make mowers that cut swaths from 3 1/2 feet all the way up to 20 feet. Plus, we offer more rearmount and undermount models than any other manufacturer of tractor-powered mowers. New tractors or old, domestic or imported, Woods has a mower to fit the tractor and the job.

Send for complete specifications on the dependable line of Woods mowers today.

for 34 years the name to remember for quality and performance

WOODS

Division of Hesston Corporation
Oregon, Illinois 61061

Circle No. 164 on Reader Inquiry Card

Ditch Witch's model 1420 steerable walk-along trencher is equipped with a 14 hp engine with a diesel option. Features include a hydraulically raised

and lowered digging boom, hydrostatic ground drive, mechanical digging chain drive, and all controls accessible from one position. The 1420 can trench depths up to five feet.

Circle No. 217 on Reader Inquiry Card

FMC's Agricultural Machinery Division has announced its 1982 line of Side-Winder farm and grounds maintenance equipment. The line includes lightweight utility sprayers with tank capacities of up to 30 gallons, flail mowers for precision grass cutting, and light-duty blades with scraper attachment for leveling gravel and moving dirt. The mainstay of the Side-Winder line is the wide selection of rotary cutters for grounds maintenance.

Circle No. 218 on Reader Inquiry Card

The Toro Co. has introduced the Groundmaster 62, a commercial turf maintenance unit combining a rotary cutting deck with a twin cylinder, 4-cycle gasoline engine. The deck is a 62-ft. wide three bladed unit, offset

16-in. to the left side to facilitate mowing under low hanging limbs and to allow trimming. The flotation-type suspension allows the deck to move independently of the prime mower for miminal scalping.

Circle No. 219 on Reader Inquiry Card

Continues on page 104

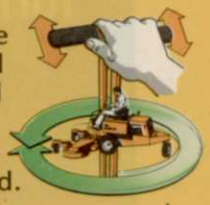
The HUSTLER SOLUTION to High Maintenance Costs.

Simple dual-hydrostatic drive system cuts maintenance, extends life.

1. Engine.
2. Tandem hydrostatic pumps.
3. Drive wheel motor.
4. Twin levers (each controls one drive wheel).
5. PTO attachment drive.

The exclusive HUSTLER dual-hydrostatic drive system has many benefits.

First, the simplicity of the system results in low daily maintenance requirements. Second, there are no expensive gears, chains, steering linkage, clutches, pulleys and drive sprockets to maintain. The HUSTLER design eliminates these high-wear components and their maintenance.



Twin levers give the operator total one-hand control of forward, reverse, turning, braking and speed.

Two hydrostatic pumps and two drive wheel motors are the heart of the HUSTLER drive system. The dual-hydrostatic pumps operate at half the pressure of single pump units, so pump life increases dramatically.

HUSTLER is the simplest, most cost-efficient and maintenance-free line of grounds maintenance tractors on the market. See your EXCEL HUSTLER distributor for the solution to high maintenance costs.

Call Toll Free 1-800-835-3260 or write for FREE literature.
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EXI-8-182

The choice of the Pros.
EXCEL HUSTLER Turf & Grounds Equipment
Circle No. 117 on Reader Inquiry Card
Call toll free 1-800-835-3260

"Little Squirt" by Aquatrols Corp. is a new irrigation unit which allows for the injection of liquid concentrates directly into the irrigation system. The unit has the capacity for a wide range of application rates from less than one-ppm to 46-ppm at a standard irrigation flow rate of 600 gpm.

Circle No. 220 on Reader Inquiry Card

Toro Co.'s new grass collecting system can be used on either the Groundmaster 52 or 62 traction units. The system consists of a 16-in. diameter blower assembly attached to the deck's discharge port and operated by the deck's PTO drive system. The one piece polypropylene chute directs the clippings into a bag support assembly made of steel tubing construction with a polypropylene bottom.

Circle No. 221 on Reader Inquiry Card

Ornalin from Mallinckrodt is a contact fungicide created for the control of Botrytis, a fungal disease affecting a broad range of ornamental plants. According to the manufacturer, use of Ornalin does not inhibit rooting of cuttings taken from treated plants, or leave unsightly residues on foliage or blooms. The active ingredient is 3-(3,5-didichlorophenyl)-5-ethenyl-5-methyl-2,4-oxazoli-dinedione.

Circle No. 222 on Reader Inquiry Card

Bunton Co. has expanded their product line with new commercial rotary mowers. The 48-in. model is designed for easy handling during transportation and is available in both turf and

lawn models, with a choice of six engines. The 61-in. model combines the advantages of Bunton tractors with the low cost of self-propelleds. It features an optional riding attachment and six forward ground speeds.

Circle No. 223 on Reader Inquiry Card

Jacobsen Division of Textron has introduced its Model 80 utility trailer for hauling turf equipment and supplies. The Model 80 has an all-steel frame and bed, 2800-lb. carrying capacity and tilts to allow an operator to drive

equipment onto its 6-ft. by 10-ft. 9-in. bed. A 1200-lb. capacity winch with a two-way ratchet and a positive off position is also featured for loading and unloading equipment.

Circle No. 224 on Reader Inquiry Card

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Turf and Ornamental Care Products.
NOW!
A complete line of Diazinon® products—Emulsifiable Concentrates, Granules or Wettable Powder—with complete labeling for turf and ornamental insect control, available through more than 40 distributors nationwide. Call or write for the distributor nearest you.
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Circle No. 146 on Reader Inquiry Card

WT&T CLASSIFIEDS

RATES: 75 cents per word (minimum charge, $20). Bold face words or words in all capital letters charged at $1.00 per word. Boxed or display ads charged at $60 per column inch (one inch minimum). Agency commissions will be given only when camera-ready art is provided by agency. For ads using blind box number, add $5 to total cost of ad. Send ad copy with payment to Dawn Anderson, WEEDS, TREES & TURF, 1 East First Street, Duluth, MN 55802.

BOX NUMBER REPLIES: Mail Box number replies to: WEEDS, TREES & TURF, Classified Ad Department, 120 W. 2nd St., Duluth, MN 55802. Please include box number in address.

HELP WANTED

HELP WANTED: MANAGER for Landscape Maintenance Department of Central Texas firm. Must have sound background in hiring, training, and supervising maintenance personnel. Salary, Company Vehicle. Send resume to WTT Box 282. 3/82

IRRIGATION SUPERVISOR for established Connecticut irrigation contractor. Previous experience in installation and supervision of irrigation crews essential. Excellent opportunity to join a rapidly expanding company. Excellent salary and future for qualified person. Send complete resume and salary history to Mark Sosnowitz, Sprinklescape, P.O. Box 175, Glenville Station, Greenwich, CT 06830. (203) 869-4149. 3/82

LANDSCAPE MAINTENANCE DIVISION SUPERVISOR: Career opportunity with a growing Wisconsin landscape contractor. Must have 3 to 5 years supervisory experience, sales experience, and a good horticultural background. Benefits. Starting salary negotiable. Send complete resume and references to: David J. Frank Landscape Contracting, Inc., N120 W21350 Freistadt Road, Germantown, WI 53022, or call (414) 255-4888. 3/82

"Leading commercial flail mower manufacturer has job openings for direct factory Territory Managers. Travel for Sales and Service with demonstration promotion of our equipment is required. Salary, profit sharing, car and travel expenses. Relocation may be necessary." Send resume to WTT Box 288. 5/82

SALESMAN For complete line to golf course and professional landscape trade in Chicago and northwest Indiana. Experience required. Huber Ranch Sod Nursery, Schneider, IN 46376 (219) 552-0552. 3/82

SALESMAN/ESTIMATOR. Our expanding company is offering an outstanding career opportunity, with an ongoing professional training program. Excellent company growth potential. Must be knowledgeable in all phases of tree, shrub, and lawn care. Must also have knowledge of insects and diseases connected with the industry. Send resume and references to Horace E. Winger, B.D. Wilhelm Co., 8200 East Harvard, Denver, Colorado 80231. Telephone: 1 (303) 755-7432. 3/82

Landscape Supervisors—minimum of one year experience in Landscape Management of either the installation/maintenance phase of the Landscape Industry. Applicant should be qualified in training subordinates, scheduling/executing job assignments, the management and mechanical ability to operate large and small equipment and a desire to grow personally and financially. Send resume and salary history to Bregenzer's, Inc., 7865 Nesbitt Ferry Road, Atlanta, GA 30360. 1-(404) 394-5730. 3/82

Pest control operator, Certified in State of Florida for Lawn and Ornamental pest control. Must have experience in insect and weed control. $15,000 yr. Send resume to: P.O. Box 10828, Tampa, FL 33679. 3/82

Asplundh and hi-Ranger forestry bucket trucks, Asplundh wood chippers, Vermeer stump grinder 2460A. Excellent Condition! Log splitters. Mirk, Incorporated, (216) 669-3567. Residence, (216) 669-3562. 7629 Chippewa Road, Orrville, OH 44667. 4/82

GOLF COURSE MANAGER—Winner Country Club, Winner, SD seeks individual to assist in all phases of golf operation. Responsibilities include all building and grounds maintenance on a rapidly growing 9 hole grass green course with complete underground irrigation and modern maintenance equipment. Salary is negotiable. Send resume to Winner Country Club, Box 141, Winner, SD 57580. 3/82

FOR SALE

Used Spray Units For Sale

1,250-gallon stainless steel tanks. Mechanical agitation. FMC 20 gallon/minute pump. Hanney electric reel. Ford F600 and Chevy C60's — '76's, '77's, '78's and '79's.

Call (502) 241-7341. T.F.

Beautiful, unique nursery in affluent part of Austin, Texas. Thriving business offers retail store, landscape design, installation, maintenance, and floral service. Well known holiday design service and long established Christmas store. Store opened in 1976. Loyal clientele. Write WTT Box 289. 3/82

For Sale—Tree Service, Mid-Hudson Valley, New York State. Bucket, Chipper, sprayer, dump truck, accounts, other accessory tools. Established over 35 Years. $50,000. Write Bartles Tree Service, Box 384, Rhinebeck, N.Y. 12572. 3/82

NEW and **USED:** Prentice Loaders; Morbark Chippers; Hydro Ax Brush Axes/Feller Bunchers; Timberjack Skidders/Forwarders. For **SALES, PARTS, SERVICE** call or write Lyons Equipment Co., Little Valley, NY 14755 (716) 938-9175. 3/82

100,000 R.R. TIES. Available at all times in various stages of processing. Offered for sale in the ground, stacked or in strictly graded bundles—picked up or delivered to accommodate particular customer's needs. We specialize in large quantity orders. Call the Professionals—America's largest tie processor—United Railroad Suppliers, 1 (800) 247-7908; In Iowa 1 (800) 542-7959. 4/82

FOR SALE 1980 FINN BANTAM 800 HYDRO-SEEDER on trailer. Electric reel—200 feet hose—discharge platform and stand. Excellent condition. Call Garry Struyk (402) 592-2233 or (712) 328-3909. 4/82

Used Spray Trucks—Chevy, 700-gallon tanks. Automatic hose reels, mechanical agitation. Call Ron Wilson (513) 845-0517. 3/82

Vermeer TS-44 Tree Spade on Cat 955 Crawler. Also Vermeer TS-44 Truck Mount Spade (less truck). Finn 1200 gal. skid mount Hydroseeder. Melroe 632 Bobcat. MF 1130 Farm tractor cab, 130 h.p. 43' drop deck trailer with ramps. (312) 438-5101. 4/82

Completely overhauled and dielectrically insulated 45' Sky-Workers—For Sale and Rent. 90 day guarantee on sales. Call Aerial Lift, Inc., Milford, Conn. (203) 878-0694. TF

SKYWORKER AERIAL BUCKETS: Sales, Parts and Service. New and used units available to 65 feet. New and Used brush chippers, Hydro Ax's, used stumpers, sprayers and digger derricks also available. Call or write P. C. GOULD SALES COMPANY, Plains Road, Essex, Conn. 06426. (203) 767-1636. 3/82

FOR SALE: Ryan Sod Cutter—$1,350. 5 gang Roseman mower—$1,350.00. 5 in. irrigation pipe—$1.00 per foot. Complete sod business, with sod & equipment. (414) 326-5267. 3/82

Colorado Rocky Mountain Tree Spraying Business located in a growing city of the Colorado Rocky Mountain's front range area. Call (303) 353-8825.

HAHN FLEX-A-MATIC 140 INCH REEL MOWERS. Total 3—1 new still in crate—2 used in good shape. $18,000 takes all plus additional parts. (516) 293-9393. 4/82

1979 FINN SUPER HYDRO-SEEDER w/elec. hose reel, 200' hose, remote valve, white paint, & diesel w/500 hrs. Selling with tandem chev., with triaxle gooseneck trlr., or without either. **1979 FINN BANTAM MULCHER** w/trailer, asphalt system, & 50' ext. hose. Very low hours. **1979 HARLEY 8' LANDSCAPE RAKE** w/scarifier. All 3 items like new. Asking 70% of new price or offer. (612) 420-5158. 3/82

MISCELLANEOUS

DIESEL HI-RANGER TOWERS—48-100 Feet working heights. Daily, weekly, monthly rentals with or without operator. MATLOCK LEASING, Pottstown, PA (215) 326-7711. 12/82

LANDSCAPE DESIGN KIT, 37 rubber symbol stamps, ink pad, $38.50 postpaid. California add $2.16 tax. Stamps kit brochures available. American Stamp Co., Box 741, Dept. WT, Reseda, California 91335. Phone (213) 881-2808. TF

NEW BALL BARRIER NETTING: Made of Olefin fibers. 6½ feet and 25 feet high. Strong and tough. Will not rust. Easy to handle. For Driving Ranges and Golf Courses. Keep golf balls from straying off-course. J.A. Cissel Co., Inc., Dept. JK, P.O. Box 339, Farmingdale, N.J. 07727. (800) 631-2234. 3/82

COLLECTIONS A PROBLEM? Try our inexpensive, do it yourself kit FREE. Satisfaction Guaranteed! For details write: Collection, 5 Tuscan Court, Huntington Station, NY 11746. 4/82

TREE STAMPS: TREELINE'S crafted rubber stamps combine quality of hand drawn trees and people with speed and convenience of stamps. Write for free catalog. **TREELINE,** 2 Greenwood Rd., Natick, MA 01760, Dept. D. 3/82

USED EQUIPMENT

USED GOLF CARS FOR SALE—All makes and models, 3 & 4 wheel, electric or gas. If we don't have your choice in stock we can get it. Transportation available. Mid-Atlantic Equipment Corp., Collegeville, PA. Call Now! (215) 489-1400. TF

BUCKET TRUCKS, SPRAYERS, MIST Blowers, Chippers, Log Splitters, Stump Grinders. Largest selection of reconditioned arborist equipment in the Northeast. Call or write with your needs. **ESSCO,** 584 **WEST HOFFMAN AVENUE, LINDENHURST, N.Y.** 11757. (516) 226-5115. 3/82

HI-RANGER BUCKET TRUCKS, 54′ and 51′, Flatbed and chip box mitts - Merrill brush chipper. Allied Enterprises, Inc., W. 204 N. 11509 Goldendale Rd., Germantown, WI 53022, (414) 255-6161 anytime. TF

HG10 (1000 gal) Hydroseeder mounted on 1968 F600 Ford. Reconditioned in our shop now. Getting ready to paint your color. Truck & machine are field ready when you pick up. Total price $9,500. Frederick, Maryland (301) 473-5160. 4/82

SPYDER Forklift and Trailer, 200 hours, excellent condition, $12,500, or cash plus sod. 285 Kubota with loader, 700 hours, $5,800. (317) 873-5231, Zionsville, Indiana. 2/82

EQUIPMENT FOR SALE—Spray truck, flat-bed truck which dumps, Case tractor, dual axle flat-bed trailer, International Skyworker Aerial-bucket, stumpgrinder, chipper, Meyers field-sprayer. Equipment in good running condition with repairs and maintenance given top priority. Call (616) 241-0567. 3/82

Spyder Forklift—200 hours. Used one season, Excellent condition. Best offer. Makielski Turf Farm, 6550 Wheaton Rd., Jackson, Michigan 49201 (517) 536-8120. 3/82

Rogers Sweeper model 730HL, 5 cu. ft. Cap., Hopper raises 8½ ft. high, sweep 60 inches wide, runs off tractor hyd. system. Like new—$3,500.00 Ryan Sod cutter—18 inch w/auto cut off newly rebuilt—$1,500.00. Phone (317) 298-9645. Green Aire Associates, Inc., P.O. Box 34157, Indianapolis, IN 46234. 4/82

1976 Toro P.T.O. 66" Rake-O-Vac, $6,000. Dedoes greens aerator, $1,000. Want to buy or trade for Jacobsen 548 seeder and Jacobsen P.T.O. blower. Contact Philip Mills (301) 722-6601, MD.

HI-RANGERS AERIAL BASKETS 65′, 57′, and 53′. Skyworkers aerial baskets 65′, 50′, 40′. Vermeer stump cutter 1560,6. Vermeer tree spade 66, TS 44. Asplundh bucket and brush chippers. Bean sprayer, 9 ton trailer. Parkway Tree Service, 12026 W. Cherry, Wauwatosa, Wisc. 53226. (414) 257-1555. TF

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Tree Service Central NJ $60,000 yr. net profit, excellent reputation. 1969 Vermeer 66" Tree spade. 1968 Hi Ranger 57' Forestry Bucket. 1973 Chevy Dump. 1968 Ford Cabover w/Prentiss loader. Asplundh 16" Chipper. Vermeer #10 Stumper. Pettibone 2217 Backhoe. 1954 Reo w/Winch A Frame. Package or separately (201) 462-4015 or (201) 544-0590. 3/82

Kershaw Klearway 10-5 $26,000, Bombardier Track Brush Cutter $20,250. J.D. 440-A skidder, $7,500. 1979 665A Stump cutter $7,500. 1973 F600 with 55' skyworker $11,200. 1980 Ford 6600 R.O.W. equipped $15,100. 5222 Hamilton Road, Columbus, GA 31904 (404) 323-0428. 3/82

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POSITION WANTED

PGA Golf Professional with excellent promotional, teaching and merchandising experience **wishes to lease or purchase golf course.** Write WTT Box 434. 3/82

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